```
=> fil reg
FILE 'REGISTRY' ENTERED AT 16:17:00 ON 29 NOV 2007
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STRUCTURE FILE UPDATES:   28 NOV 2007  HIGHEST RN 956214-95-2
DICTIONARY FILE UPDATES:  28 NOV 2007  HIGHEST RN 956214-95-2

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TSCA INFORMATION NOW CURRENT THROUGH June 29, 2007

  Please note that search-term pricing does apply when
  conducting SmartSELECT searches.

REGISTRY includes numerically searchable data for experimental and
predicted properties as well as tags indicating availability of
experimental property data in the original document.  For information
on property searching in REGISTRY, refer to:

http://www.cas.org/support/stngen/stndoc/properties.html

=> d que stat l12
L6                STR
```

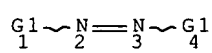
G1 11

```
VAR G1=4/9
NODE ATTRIBUTES:
NSPEC   IS RC     AT   1
NSPEC   IS RC     AT   2
NSPEC   IS RC     AT   3
DEFAULT MLEVEL IS ATOM
GGCAT   IS UNS  AT   6
GGCAT   IS UNS  AT   8
DEFAULT ECLEVEL IS LIMITED

GRAPH ATTRIBUTES:
RING(S) ARE ISOLATED OR EMBEDDED
NUMBER OF NODES IS  11

STEREO ATTRIBUTES: NONE
L7                SCR 1781 OR 1782
L9        553397 SEA FILE=REGISTRY SSS FUL L6 AND L7
L10       532170 SEA FILE=REGISTRY ABB=ON  PLU=ON  L9 NOT PMS/CI
L11       514406 SEA FILE=REGISTRY ABB=ON  PLU=ON  L10 NOT M/ELS
L12        61062 SEA FILE=REGISTRY ABB=ON  PLU=ON  L11 AND (C(L)H(L)O(L)S)
                 /ELS AND 4/ELC.SUB


=> d que stat l24
L14               STR
```

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VAR G1=5/6
NODE ATTRIBUTES:
DEFAULT MLEVEL IS ATOM
GGCAT   IS SAT  AT   5
GGCAT   IS UNS  AT   6
DEFAULT ECLEVEL IS LIMITED

GRAPH ATTRIBUTES:
RING(S) ARE ISOLATED OR EMBEDDED
NUMBER OF NODES IS   6

STEREO ATTRIBUTES: NONE
L16             SCR 2108
L18             SCR 1665
L20             SCR 2043
L22      328901 SEA FILE=REGISTRY SSS FUL L14 AND L16 AND L18 NOT L20
L24      288089 SEA FILE=REGISTRY ABB=ON  PLU=ON  L22 NOT M/ELS


=> d his nofile

     (FILE 'HOME' ENTERED AT 13:40:00 ON 29 NOV 2007)

     FILE 'HCAPLUS' ENTERED AT 13:40:10 ON 29 NOV 2007
L1            1 SEA ABB=ON  PLU=ON  US2004048163/PN
                SEL RN

     FILE 'REGISTRY' ENTERED AT 13:40:46 ON 29 NOV 2007
L2           54 SEA ABB=ON  PLU=ON  (10377-51-2/BI OR 10411-26-4/BI OR
                105-58-8/BI OR 105-64-6/BI OR 105-74-8/BI OR 108-32-7/BI
                OR 108-88-3/BI OR 108-90-7/BI OR 126-33-0/BI OR 126-58-9/
                BI OR 127-63-9/BI OR 131651-65-5/BI OR 1330-20-7/BI OR
                14024-11-4/BI OR 14283-07-9/BI OR 14666-78-5/BI OR
                149-32-6/BI OR 15520-11-3/BI OR 1561-49-5/BI OR 162684-16
                -4/BI OR 1712-87-4/BI OR 18424-17-4/BI OR 193215-00-8/BI
                OR 21324-40-3/BI OR 26748-41-4/BI OR 27359-10-0/BI OR
                28452-93-9/BI OR 29935-35-1/BI OR 3006-82-4/BI OR
                32752-09-3/BI OR 33454-82-9/BI OR 35363-40-7/BI OR
                39300-70-4/BI OR 4437-85-8/BI OR 462-06-6/BI OR 502-44-3/
                BI OR 56-81-5/BI OR 56525-42-9/BI OR 616-38-6/BI OR
                620-32-6/BI OR 623-53-0/BI OR 623-96-1/BI OR 67-71-0/BI
                OR 71-43-2/BI OR 77-77-0/BI OR 7790-99-0/BI OR 7791-03-9/
                BI OR 78-67-1/BI OR 79-10-7/BI OR 90076-65-6/BI OR
                92177-99-6/BI OR 94-36-0/BI OR 96-49-1/BI OR 98-95-3/BI)
                D SCA
L3            9 SEA ABB=ON  PLU=ON  L2 AND S/ELS
                D SCA
L4            3 SEA ABB=ON  PLU=ON  L2 AND N/ELS
                D SCA

     FILE 'HCAPLUS' ENTERED AT 13:55:39 ON 29 NOV 2007
L5            1 SEA ABB=ON  PLU=ON  L1 AND L3
                D HITSTR

     FILE 'LREGISTRY' ENTERED AT 14:01:04 ON 29 NOV 2007
```

```
L6              STR

     FILE 'REGISTRY' ENTERED AT 14:03:49 ON 29 NOV 2007
L7              SCR 1781 OR 1782
L8            50 SEA SSS SAM L6 AND L7
L9        553397 SEA SSS FUL L6 AND L7
L10       532170 SEA ABB=ON  PLU=ON  L9 NOT PMS/CI
L11       514406 SEA ABB=ON  PLU=ON  L10 NOT M/ELS
L12        61062 SEA ABB=ON  PLU=ON  L11 AND (C(L)H(L)O(L)S)/ELS AND
                 4/ELC.SUB
L13            6 SEA ABB=ON  PLU=ON  L2 AND L12
                 SAV TEMP L12 WEI086A/A

     FILE 'STNGUIDE' ENTERED AT 15:02:25 ON 29 NOV 2007

     FILE 'LREGISTRY' ENTERED AT 15:03:08 ON 29 NOV 2007
L14             STR

     FILE 'REGISTRY' ENTERED AT 15:07:15 ON 29 NOV 2007
L15           50 SEA SSS SAM L14
L16              SCR 2108
L17           50 SEA SSS SAM L14 AND L16
L18              SCR 1665
L19           50 SEA SSS SAM L14 AND L16 AND L18
L20              SCR 2043
L21           50 SEA SSS SAM L14 AND L16 AND L18 NOT L20
L22       328901 SEA SSS FUL L14 AND L16 AND L18 NOT L20
L23            1 SEA ABB=ON  PLU=ON  L2 AND L22
L24       288089 SEA ABB=ON  PLU=ON  L22 NOT M/ELS
                 SAV TEMP L24 WEI086B/A
L25            1 SEA ABB=ON  PLU=ON  L2 AND C6H10O6/MF
L26            1 SEA ABB=ON  PLU=ON  L2 AND C18H34O4/MF
L27            1 SEA ABB=ON  PLU=ON  L2 AND C8H14O6/MF
L28            1 SEA ABB=ON  PLU=ON  L2 AND C14H22O6/MF
L29            1 SEA ABB=ON  PLU=ON  L2 AND C12H24O3/MF
L30            1 SEA ABB=ON  PLU=ON  L2 AND C22H38O6/MF
L31            1 SEA ABB=ON  PLU=ON  L2 AND C8H18O2/MF
L32            1 SEA ABB=ON  PLU=ON  L2 AND C24H46O4/MF
L33            1 SEA ABB=ON  PLU=ON  L2 AND C14H10O4/MF
L34            1 SEA ABB=ON  PLU=ON  L2 AND C16H14O4/MF
L35           10 SEA ABB=ON  PLU=ON  (L25 OR L26 OR L27 OR L28 OR L29 OR
                 L30 OR L31 OR L32 OR L33 OR L34)

     FILE 'HCAPLUS' ENTERED AT 15:44:00 ON 29 NOV 2007
L36        40822 SEA ABB=ON  PLU=ON  L12
L37       124918 SEA ABB=ON  PLU=ON  L24
L38        14440 SEA ABB=ON  PLU=ON  L35
L39              QUE ABB=ON  PLU=ON  AZO?
L40              QUE ABB=ON  PLU=ON  ?PEROX?
L41         2947 SEA ABB=ON  PLU=ON  L36 AND (L37 OR L38 OR L39 OR L40)
L42              QUE ABB=ON  PLU=ON  ELECTROLY?
L43           50 SEA ABB=ON  PLU=ON  L41 AND L42
L44              QUE ABB=ON  PLU=ON  (LI OR LITHIUM)(3A)BATTER?
L45              QUE ABB=ON  PLU=ON  (LI OR LITHIUM)(2A)SALT
L46         8872 SEA ABB=ON  PLU=ON  L23
L47           15 SEA ABB=ON  PLU=ON  L43 AND (L44 OR L45)
L48            7 SEA ABB=ON  PLU=ON  L47 AND L38
L49            5 SEA ABB=ON  PLU=ON  L47 AND L46
L50              QUE ABB=ON  PLU=ON  WT## OR WEIGHT?
L51            0 SEA ABB=ON  PLU=ON  L47 AND L50
```

```
L52          15 SEA ABB=ON  PLU=ON  L47 OR L48 OR L49
L53           3 SEA ABB=ON  PLU=ON  L48 AND L49
L54          12 SEA ABB=ON  PLU=ON  L52 NOT L53

=> fil hcap
FILE 'HCAPLUS' ENTERED AT 16:17:10 ON 29 NOV 2007
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FILE COVERS 1907 - 29 Nov 2007  VOL 147 ISS 23
FILE LAST UPDATED: 28 Nov 2007  (20071128/ED)

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 This file contains CAS Registry Numbers for easy and accurate
 substance identification.

=> d l53 ibib abs hitstr hitind 1-3

L53  ANSWER 1 OF 3  HCAPLUS  COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER:         2007:41382  HCAPLUS  Full-text
DOCUMENT NUMBER:          146:145946
TITLE:                    Electrolyte for lithium
                          secondary battery
INVENTOR(S):              Kim, Cheonsoo
PATENT ASSIGNEE(S):       Samsung Sdi Co., Ltd., S. Korea
SOURCE:                   U.S. Pat. Appl. Publ., 11pp.
                          CODEN: USXXCO
DOCUMENT TYPE:            Patent
LANGUAGE:                 English
FAMILY ACC. NUM. COUNT:   1
PATENT INFORMATION:

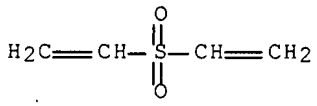
     PATENT NO.           KIND   DATE        APPLICATION NO.        DATE
     ---------------      ----   --------    --------------------
     --------
     US 2007009806         A1    20070111    US 2006-481911
                                                                   200607
                                                                   07
     KR 2007006253         A     20070111    KR 2005-61409
                                                                   200507
                                                                   07
PRIORITY APPLN. INFO.:                       KR 2005-61409       A
                                                                   200507
                                                                   07

OTHER SOURCE(S):          MARPAT 146:145946
```

AB The invention concerns an **electrolyte** for a **lithium** secondary **battery** and a **lithium** secondary **battery** having the **electrolyte**, the **electrolyte** including a **lithium salt**; a non-aqueous organic solvent including γ-butyrolactone-; and a succinic anhydride.

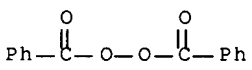
IT **77-77-0**, Divinyl sulfone
RL: MOA (Modifier or additive use); USES (Uses)
(**electrolyte** for **lithium** secondary **battery**)

RN 77-77-0 HCAPLUS
CN Ethene, 1,1'-sulfonylbis- (CA INDEX NAME)

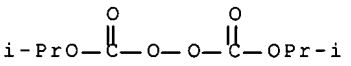


IT **94-36-0**, Dibenzoyl **peroxide**, reactions
105-64-6, Di-isopropyl **peroxydicarbonate**
105-74-8, Dilauroyl **peroxide** **3006-82-4**, tert-**Butylperoxy**-2-ethyl hexanoate **15520-11-3**, Bis(4-tert-butylcyclohexyl) **peroxydicarbonate**
RL: RCT (Reactant); RACT (Reactant or reagent)
(**electrolyte** for **lithium** secondary **battery**)

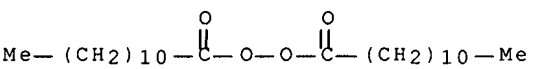
RN 94-36-0 HCAPLUS
CN Peroxide, dibenzoyl (CA INDEX NAME)



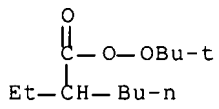
RN 105-64-6 HCAPLUS
CN Peroxydicarbonic acid, C,C'-bis(1-methylethyl) ester (CA INDEX NAME)



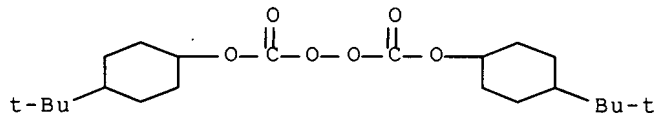
RN 105-74-8 HCAPLUS
CN Peroxide, bis(1-oxododecyl) (CA INDEX NAME)



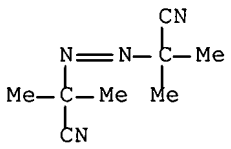
RN 3006-82-4 HCAPLUS
CN Hexaneperoxoic acid, 2-ethyl-, 1,1-dimethylethyl ester (CA INDEX NAME)



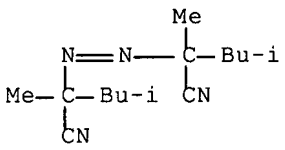
RN 15520-11-3 HCAPLUS
CN Peroxydicarbonic acid, C,C'-bis[4-(1,1-dimethylethyl)cyclohexyl] ester (CA INDEX NAME)



IT **78-67-1**, 2,2'-**Azo**-bis(isobutyronitrile)
4419-11-8, 2,2'-**Azo**-bis(2,4-dimethyl valeronitrile)
RL: TEM (Technical or engineered material use); USES (Uses)
(**electrolyte** for **lithium** secondary **battery**)
RN 78-67-1 HCAPLUS
CN Propanenitrile, 2,2'-(1,2-diazenediyl)bis[2-methyl- (CA INDEX NAME)



RN 4419-11-8 HCAPLUS
CN Pentanenitrile, 2,2'-(1,2-diazenediyl)bis[2,4-dimethyl- (CA INDEX NAME)



INCL 429329000; 429332000; 429200000
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
ST **electrolyte lithium** secondary **battery**
IT **Battery electrolytes**
(**electrolyte** for **lithium** secondary **battery**)
IT Aromatic hydrocarbons, uses
Esters, uses

Ethers, uses
Ketones, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(**electrolyte** for **lithium** secondary **battery**)

IT Secondary **batteries**
(**lithium**; **electrolyte** for **lithium** secondary **battery**)

IT **77-77-0**, Divinyl sulfone 96-48-0, γ-Butyrolactone 108-30-5, Succinic anhydride, uses 872-36-6, Vinylene carbonate 3741-38-6, Ethylene sulfite 25721-76-0, Poly(ethylene glycol)dimethacrylate 26570-48-9, Poly(ethylene glycol)diacrylate 413569-08-1 919110-87-5
RL: MOA (Modifier or additive use); USES (Uses)
(**electrolyte** for **lithium** secondary **battery**)

IT **94-36-0**, Dibenzoyl **peroxide**, reactions **105-64-6**, Di-isopropyl **peroxydicarbonate** **105-74-8**, Dilauroyl **peroxide** 107-71-1, tert-Butyl **peroxy** acetate 109-13-7, tert-Butyl **peroxy** isobutyrate 110-22-5, Diacetyl **peroxide** 614-45-9, tert-Butyl **peroxy** benzoate 686-31-7, tert-**Amylperoxy** 2-ethyl hexanoate 927-07-1, tert-Butyl **peroxypivalate** 2372-21-6, tert-Butyl **peroxy** isopropyl carbonate **3006-82-4**, tert-**Butylperoxy** -2-ethyl hexanoate 3851-87-4, Bis(3,5,5-trimethylhexanoyl) **peroxide** 13122-18-4 15518-51-1, Diethylene glycol bis(tert-butyl **peroxycarbonate**) **15520-11-3**, Bis(4-tert-butylcyclohexyl) **peroxydicarbonate** 16111-62-9, Di-2-ethylhexyl **peroxy** dicarbonate 26748-38-9, tert-Butyl **peroxy** neoheptanoate 29240-17-3, tert-Amyl **peroxypivalate** 34443-12-4, tert-Butyl **peroxy**-2-ethylhexyl carbonate 36536-42-2 51938-28-4, tert-Hexyl **peroxypivalate** 52238-68-3 68860-54-8 919110-90-0
RL: RCT (Reactant); RACT (Reactant or reagent)
(**electrolyte** for **lithium** secondary **battery**)

IT 71-43-2, Benzene, uses **78-67-1**, 2,2'-**Azo** -bis(isobutyronitrile) 96-49-1, Ethylene carbonate 105-58-8, Diethyl carbonate 108-32-7, Propylene carbonate 108-67-8, Mesitylene, uses 108-86-1, Bromobenzene, uses 108-88-3, Toluene, uses 108-90-7, Chlorobenzene, uses 462-06-6, Fluorobenzene 463-79-6D, Carbonic acid, ester 616-38-6, Dimethyl carbonate 623-53-0, EthylMethyl carbonate 623-96-1, Dipropyl carbonate 1330-20-7, Xylene, uses 2094-98-6 **4419-11-8**, 2,2'-**Azo**-bis(2,4-dimethyl valeronitrile) 4437-70-1, 2,3-Butylene carbonate 4437-85-8, 1,2-Butylene carbonate 4437-86-9 7447-41-8, Lithium chloride, uses 7791-03-9, Lithium perchlorate 10377-51-2, Lithium iodide 14024-11-4, Lithium tetrachloroaluminate 14283-07-9, Lithium tetrafluoroborate 18424-17-4, Lithium hexafluoroantimonate 21324-40-3, Lithium hexafluorophosphate 29935-35-1, Lithium hexafluoroarsenate 33454-82-9, Lithium triflate 35363-40-7, Ethylpropyl carbonate 37220-89-6, Aluminum lithium oxide 56525-42-9, Methylpropyl carbonate 89489-56-5, 1,2-Pentylene carbonate 90076-65-6 114435-02-8, Fluoroethylene carbonate 131651-65-5
RL: TEM (Technical or engineered material use); USES (Uses)
(**electrolyte** for **lithium** secondary **battery**)

L53 ANSWER 2 OF 3 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 2004:203431 HCAPLUS Full-text
DOCUMENT NUMBER: 140:238483
TITLE: **Electrolyte** for a **lithium battery**
INVENTOR(S): Park, Yong-Chul; Jung, Won-Ii; Kim, Geun-Bae; Cho, Jae-Phil; Jung, Cheol-Soo
PATENT ASSIGNEE(S): S. Korea
SOURCE: U.S. Pat. Appl. Publ., 13 pp.
CODEN: USXXCO
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 2004048163	A1	20040311	US 2003-656086	20030905
KR 2004022054	A	20040311	KR 2002-53879	20020906
JP 2004103573	A	20040402	JP 2003-282119	20030729
CN 1495961	A	20040512	CN 2003-164853	20030906

PRIORITY APPLN. INFO.: KR 2002-53879 A 20020906

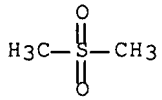
OTHER SOURCE(S): MARPAT 140:238483

AB An **electrolyte** for a **lithium battery** includes a nonaq. organic solvent, a **lithium salt**, and an additive comprising (a) a sulfone-based compound and (b) a C3-30 organic **peroxide** or **azo**-based compound The **electrolyte** may further include a poly(ester)(meth)acrylate or a polymer that is derived from a (polyester)polyol with at least three hydroxyl (-OH) groups, where a portion or all of the hydroxyl groups are substituted with a (meth)acrylic ester and the remaining hydroxyl groups that are not substituted with the (meth)acrylic ester are substituted with a group having no radical reactivity. The **lithium battery** comprising the **electrolyte** of the present invention has a significantly improved charge-discharge and cycle life characteristics, recovery capacity ratio at high temperature, and swelling inhibition properties.

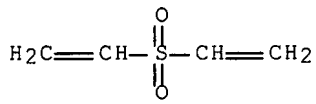
IT **67-71-0**, Methyl sulfone **77-77-0**, Vinyl sulfone **78-67-1**, 2,2'-**Azobisisobutyronitrile** **94-36-0**, Benzoyl **peroxide**, uses **105-64-6**, Diisopropyl **peroxy** dicarbonate **105-74-8**, Lauroyl **peroxide** **126-33-0**, Tetramethylene sulfone **127-63-9**, Phenyl sulfone **620-32-6**, Benzyl sulfone **1561-49-5**, **Dicyclohexylperoxy** dicarbonate **1712-87-4**, m-Toluoyl **peroxide** **3006-82-4**, tert-**Butylperoxy**-2-ethyl hexanoate **14666-78-5** **15520-11-3**, Bis(4-tert-butylcyclohexyl) **peroxy** dicarbonate **28452-93-9**, Butadiene sulfone **32752-09-3**, Isobutyl **peroxide** **92177-99-6**

, 3,3,5-Trimethylhexanoyl **peroxide**
RL: MOA (Modifier or additive use); USES (Uses)
(**electrolyte** for **lithium battery**)

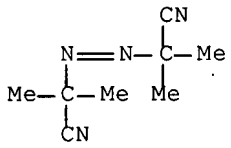
RN 67-71-0 HCAPLUS
CN Methane, 1,1'-sulfonylbis- (CA INDEX NAME)



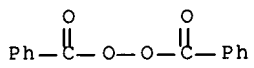
RN 77-77-0 HCAPLUS
CN Ethene, 1,1'-sulfonylbis- (CA INDEX NAME)



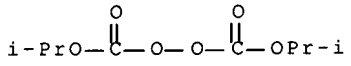
RN 78-67-1 HCAPLUS
CN Propanenitrile, 2,2'-(1,2-diazenediyl)bis[2-methyl- (CA INDEX NAME)



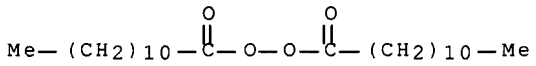
RN 94-36-0 HCAPLUS
CN Peroxide, dibenzoyl (CA INDEX NAME)



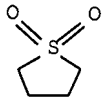
RN 105-64-6 HCAPLUS
CN Peroxydicarbonic acid, C,C'-bis(1-methylethyl) ester (CA INDEX NAME)



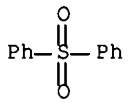
RN 105-74-8 HCAPLUS
CN Peroxide, bis(1-oxododecyl) (CA INDEX NAME)



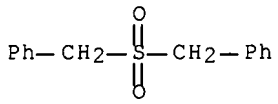
RN 126-33-0 HCAPLUS
CN Thiophene, tetrahydro-, 1,1-dioxide (CA INDEX NAME)



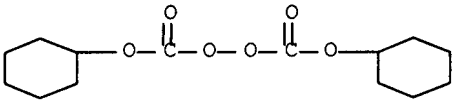
RN 127-63-9 HCAPLUS
CN Benzene, 1,1'-sulfonylbis- (CA INDEX NAME)



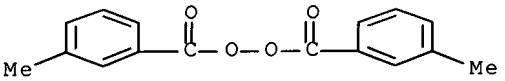
RN 620-32-6 HCAPLUS
CN Benzene, 1,1'-[sulfonylbis(methylene)]bis- (CA INDEX NAME)



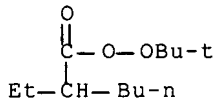
RN 1561-49-5 HCAPLUS
CN Peroxydicarbonic acid, C,C'-dicyclohexyl ester (CA INDEX NAME)



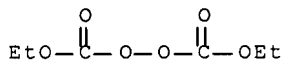
RN 1712-87-4 HCAPLUS
CN Peroxide, bis(3-methylbenzoyl) (CA INDEX NAME)



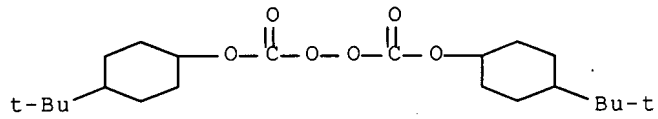
RN 3006-82-4 HCAPLUS
CN Hexaneperoxoic acid, 2-ethyl-, 1,1-dimethylethyl ester (CA INDEX NAME)



RN 14666-78-5 HCAPLUS
CN Peroxydicarbonic acid, diethyl ester (CA INDEX NAME)



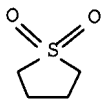
RN 15520-11-3 HCAPLUS
CN Peroxydicarbonic acid, C,C'-bis[4-(1,1-dimethylethyl)cyclohexyl] ester (CA INDEX NAME)



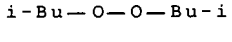
RN 28452-93-9 HCAPLUS
CN Thiophene, dihydro-, 1,1-dioxide (CA INDEX NAME)

CM 1

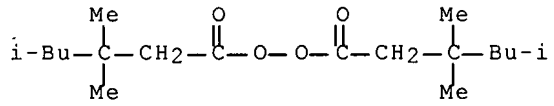
CRN 126-33-0
CMF C4 H8 O2 S



RN 32752-09-3 HCAPLUS
CN Peroxide, bis(2-methylpropyl) (CA INDEX NAME)



RN 92177-99-6 HCAPLUS
CN Peroxide, bis(3,3,5-trimethyl-1-oxohexyl) (9CI) (CA INDEX NAME)



IC ICM H01M010-40
INCL 429326000; 429329000; 429339000; 429340000
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 38
ST **lithium battery electrolyte**
IT **Battery electrolytes**
(**electrolyte** for **lithium battery**)
IT Aromatic hydrocarbons, uses
Carbonates, uses
Esters, uses
Ethers, uses
Ketones, uses
RL: DEV (Device component use); USES (Uses)
(**electrolyte** for **lithium battery**)
IT **Azo** compounds
RL: MOA (Modifier or additive use); USES (Uses)
(**electrolyte** for **lithium battery**)
IT Carbonaceous materials (technological products)
RL: MOA (Modifier or additive use); USES (Uses)
(**electrolyte** for **lithium battery**)
IT Sulfones
RL: MOA (Modifier or additive use); USES (Uses)
(**electrolyte** for **lithium battery**)
IT Polyesters, uses
RL: DEV (Device component use); USES (Uses)
(hydroxy-terminated; **electrolyte** for **lithium battery**)
IT Secondary **batteries**
(**lithium**; **electrolyte** for **lithium battery**)
IT Polyesters, uses
RL: DEV (Device component use); USES (Uses)
(methacrylate; **electrolyte** for **lithium battery**)
IT **Peroxides**, uses
RL: MOA (Modifier or additive use); USES (Uses)
(organic, C3-30; **electrolyte** for **lithium battery**)
IT Esters, uses
RL: DEV (Device component use); USES (Uses)
(poly-; **electrolyte** for **lithium battery**)
IT Imides
Sulfonic acids, uses
RL: DEV (Device component use); USES (Uses)
(sulfonimides, perfluoro derivs., **lithium salts**; **electrolyte** for **lithium battery**)
IT 56-81-5, Glycerol, uses 71-43-2, Benzene, uses 96-49-1, Ethylene carbonate 98-95-3, Nitrobenzene, uses 105-58-8, Diethyl carbonate 108-32-7, Propylene carbonate 108-88-3, Toluene, uses 108-90-7, Chlorobenzene, uses 149-32-6, Erythritol 462-06-6,

Fluorobenzene 616-38-6, Dimethyl carbonate 623-53-0, Methylethyl carbonate 623-96-1, Dipropyl carbonate 1330-20-7, Xylene, uses 4437-85-8, Butylene carbonate 7790-99-0, Iodine chloride (ICl) 7791-03-9, Lithium perchlorate 10377-51-2, Lithium iodide (LiI) 14024-11-4, Lithium tetrachloroaluminate 14283-07-9, Lithium tetrafluoroborate 18424-17-4, Lithium hexafluoroantimonate 21324-40-3, Lithium hexafluorophosphate 27359-10-0, Trifluorotoluene 29935-35-1, Lithium hexafluoroarsenate 33454-82-9, Lithium triflate 35363-40-7, Ethyl propyl carbonate, uses 39300-70-4, Lithium nickel oxide 56525-42-9, Methyl propyl carbonate, uses 90076-65-6 131651-65-5, Lithium nonafluorobutanesulfonate 162684-16-4, Lithium manganese nickel oxide 193215-00-8, Cobalt lithiummanganese nickel oxide Co0.1LiMn0.2Ni0.7O2
RL: DEV (Device component use); USES (Uses)
(**electrolyte** for **lithium battery**)

IT **67-71-0**, Methyl sulfone **77-77-0**, Vinyl sulfone **78-67-1**, 2,2'-**Azobisisobutyronitrile** **94-36-0**, Benzoyl **peroxide**, uses **105-64-6**, Diisopropyl **peroxy** dicarbonate **105-74-8**, Lauroyl **peroxide** **126-33-0**, Tetramethylene sulfone **127-63-9**, Phenyl sulfone **620-32-6**, Benzyl sulfone **1561-49-5**, **Dicyclohexylperoxy** dicarbonate **1712-87-4**, m-Toluoyl **peroxide** **3006-82-4**, tert-**Butylperoxy**-2-ethyl hexanoate **14666-78-5** **15520-11-3**, Bis(4-tert-butylcyclohexyl) **peroxy** dicarbonate 26748-41-4 **28452-93-9**, Butadiene sulfone **32752-09-3**, Isobutyl **peroxide** **92177-99-6**, 3,3,5-Trimethylhexanoyl **peroxide**
RL: MOA (Modifier or additive use); USES (Uses)
(**electrolyte** for **lithium battery**)

IT 79-10-7DP, Acrylic acid, reaction product with dipentaerythritol and ε-caprolactone and butylcarbonic acid 126-58-9DP, Dipentaerythritol, reaction product with ε-caprolactone and acrylic acid and butylcarbonic acid 502-44-3DP, ε-Caprolactone, reaction product with dipentaerythritol and acrylic acid and butylcarbonic acid 10411-26-4DP, MonoButylcarbonate, reaction product with dipentaerythritol and ε-caprolactone and acrylic acid
RL: MOA (Modifier or additive use); SPN (Synthetic preparation); PREP (Preparation); USES (Uses)
(**electrolyte** for **lithium battery**)

L53 ANSWER 3 OF 3 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 1996:754386 HCAPLUS Full-text
DOCUMENT NUMBER: 126:92052
TITLE: Catalyst-containing solid **electrolytes** and batteries using these **electrolytes**
INVENTOR(S): Chaloner-Gill, Benjamin; Olsen, Ib I.; Saidi, Eileen S.
PATENT ASSIGNEE(S): USA
SOURCE: U.S., 8 pp.
CODEN: USXXAM
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

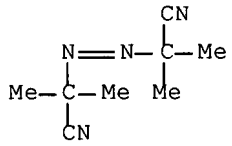
PATENT NO.	KIND	DATE	APPLICATION NO.	DATE

US 5580680	A	19961203	US 1994-267066	199406 27
PRIORITY APPLN. INFO.:			US 1994-267066	199406 27

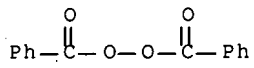
AB The **electrolytes** include a 1st catalyst that is capable of initiating the polymerization of solvent components at elevated temps. to increase the resistance (or impedance) of the solid **electrolyte** and thereby prevent thermal runaway and/or a 2nd catalyst that is capable of initiating the polymerization of flammable substances (e.g., olefins) in the solvent. To assure that the catalysts do not prematurely initiate polymerization below a certain temperature, the catalysts may be microencapsulated within a heat-sensitive material that disintegrates or dissolve at a predetd. elevated temperature to release the catalysts. Microencapsulation permits the controlled release of the catalysts into the **electrolyte** under the appropriate conditions.

IT **78-67-1, Azobisisobutyronitrile 94-36-0,** Benzoyl **peroxide,** uses
RL: CAT (Catalyst use); USES (Uses)
(polymerization catalyst for battery solid **electrolytes**)

RN 78-67-1 HCAPLUS
CN Propanenitrile, 2,2'-(1,2-diazenediyl)bis[2-methyl- (CA INDEX NAME)

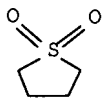


RN 94-36-0 HCAPLUS
CN Peroxide, dibenzoyl (CA INDEX NAME)



IT **126-33-0,** Sulfolane
RL: MOA (Modifier or additive use); USES (Uses)
(polymerization catalyst for battery solid **electrolytes** containing solvent of)

RN 126-33-0 HCAPLUS
CN Thiophene, tetrahydro-, 1,1-dioxide (CA INDEX NAME)



IC ICM H01M006-16

INCL 429192000
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 37
ST battery solid **electrolyte** solvent polymn catalyst;
flammable substance polymn catalyst battery **electrolyte**;
safety battery polymn catalyst **electrolyte**
IT Polymerization catalysts
(Ziegler-Natta; for battery solid **electrolytes**)
IT Polymerization catalysts
(battery solid **electrolytes** containing)
IT Battery **electrolytes**
(containing polymerization catalyst)
IT Secondary **batteries**
(**lithium**; with polymerization catalysts for safety)
IT Safety
(of **lithium batteries** with polymerization
catalysts-containing solid **electrolytes**)
IT Bronsted acids
RL: CAT (Catalyst use); USES (Uses)
(polymerization catalyst for battery solid **electrolytes**)
IT **78-67-1, Azobisisobutyronitrile 94-36-0,**
Benzoyl **peroxide**, uses 110-22-5, Acetyl **peroxide**
7440-23-5, Sodium, uses 7637-07-2, Boron trifluoride, uses
RL: CAT (Catalyst use); USES (Uses)
(polymerization catalyst for battery solid **electrolytes**)
IT 67-68-5, uses 96-48-0, γ-Butyrolactone 96-49-1, Ethylene
carbonate 108-32-7, Propylene carbonate 110-71-4, Glyme
111-96-6, Diglyme 112-49-2, Triglyme **126-33-0**, Sulfolane
143-24-8, Tetraglyme 646-06-0, Dioxolane
RL: MOA (Modifier or additive use); USES (Uses)
(polymerization catalyst for battery solid **electrolytes** containing
solvent of)

=> d 154 ibib abs hitstr hitind 1-12

L54 ANSWER 1 OF 12 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 2007:1278662 HCAPLUS Full-text
TITLE: Anion receptor comprising aromatic amines substituted with electron withdrawing groups and **electrolyte** using the same for alkali metal batteries
INVENTOR(S): Kim, Hee Jung; Lee, Won Sil
PATENT ASSIGNEE(S): Kyungwon Enterprise Co., Ltd., S. Korea
SOURCE: PCT Int. Appl., 63pp.
CODEN: PIXXD2
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2007126262	A1	20071108	WO 2007-KR2080	200704 27

W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BH, BR, BW, BY, BZ,
CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES,
FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IS, JP,

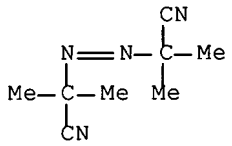
KE, KG, KM, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LY,
MA, MD, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM,
PG, PH, PL, PT, RO, RS, RU, SC, SD, SE, SG, SK, SL, SM, SV,
SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM,
ZW
RW: AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU,
IE, IS, IT, LT, LU, LV, MC, MT, NL, PL, PT, RO, SE, SI, SK,
TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN,
TD, TG, BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG,
ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM

PRIORITY APPLN. INFO.: KR 2006-38047 A 200604 27

AB Disclosed is a novel anion receptor and **electrolytes** containing the same. A novel anion receptor is an aromatic hydrocarbon compound having an amine substituted with electron withdrawing groups. When the anion receptor is added to the **electrolyte**, ionic conductivity and cation transference number of **electrolytes** are enhanced, thereby increasing the electrochem. stability of alkali metal batteries using the **electrolytes**. Thus, sulfonylation of 4-hexylaniline with triflic anhydride afforded the anionic receptor 4-[H(CH2)6]C6H4N(SO2CF3)2 (4-hexylphenyl-TFSI); the latter was mixed with 0.8 g bisphenol A ethoxylate dimethacrylate (crosslinking agent) and lithium triflate and to this mixture was subsequently added dimethoxyphenylacetophenone and the resulting solution coated onto a conductive glass substrate and exposed to UV irradiation, forming the solid polymer **electrolyte**. The ionic conductivity of the solid polymer **electrolyte** containing 4-hexylphenyl-TFSI as anion receptor exceeded the comparative **electrolyte** without anion receptor as temperature increased.

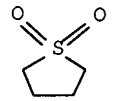
IT **78-67-1**, AIBN
RL: CAT (Catalyst use); USES (Uses)
(heat-curing initiator for polymer **electrolyte**; anion receptor comprising aromatic amines substituted with electron withdrawing groups and **electrolyte** using the same for alkali metal batteries)

RN 78-67-1 HCAPLUS
CN Propanenitrile, 2,2'-(1,2-diazenediyl)bis[2-methyl- (CA INDEX NAME)



IT **126-33-0**, Sulfolane
RL: TEM (Technical or engineered material use); USES (Uses)
(nonaq. solvent; anion receptor comprising aromatic amines substituted with electron withdrawing groups and **electrolyte** using the same for alkali metal batteries)

RN 126-33-0 HCAPLUS
CN Thiophene, tetrahydro-, 1,1-dioxide (CA INDEX NAME)



CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
ST alkali metal battery anion receptor arom amine **electrolyte**
IT Anions
Battery **electrolytes**
Ionic conductivity
Polymer **electrolytes**
(anion receptor comprising aromatic amines substituted with electron withdrawing groups and **electrolyte** using the same for alkali metal batteries)
IT Amines
RL: SPN (Synthetic preparation); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(aromatic, substituted with electron withdrawing groups, as anion receptors; anion receptor comprising aromatic amines substituted with electron withdrawing groups and **electrolyte** using the same for alkali metal batteries)
IT Carbon black
RL: TEM (Technical or engineered material use); USES (Uses)
(cathode coating; anion receptor comprising aromatic amines substituted with electron withdrawing groups and **electrolyte** using the same for alkali metal batteries)
IT Fluoropolymers
RL: POF (Polymer in formulation); TEM (Technical or engineered material use); USES (Uses)
(cathode coatings; anion receptor comprising aromatic amines substituted with electron withdrawing groups and **electrolyte** using the same for alkali metal batteries)
IT Secondary **batteries**
(**lithium**; anion receptor comprising aromatic amines substituted with electron withdrawing groups and **electrolyte** using the same for alkali metal batteries)
IT Polyoxyalkylenes
RL: POF (Polymer in formulation); TEM (Technical or engineered material use); USES (Uses)
(polymer **electrolytes**; anion receptor comprising aromatic amines substituted with electron withdrawing groups and **electrolyte** using the same for alkali metal batteries)
IT Receptors
RL: SPN (Synthetic preparation); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(synthetic; anion receptor comprising aromatic amines substituted with electron withdrawing groups and **electrolyte** using the same for alkali metal batteries)
IT lithium alloy, base, base
RL: TEM (Technical or engineered material use); USES (Uses)
(anode; anion receptor comprising aromatic amines substituted with electron withdrawing groups and **electrolyte** using the same for alkali metal batteries)
IT 7447-41-8, Lithium chloride 7550-35-8, Lithium bromide 7791-03-9, Lithium perchlorate 10377-51-2, Lithium iodide 14283-07-9, Lithium tetrafluoroborate 18424-17-4, Lithium hexafluoroantimonate 21324-40-3, Lithium hexafluorophosphate 29935-35-1, Lithium hexafluoroarsenate 33454-82-9, Lithium triflate 87187-79-9 90076-65-6, Lithium

bis(trifluoromethanesulfonyl)imide 132404-42-3
RL: MOA (Modifier or additive use); USES (Uses)
(anion receptor comprising aromatic amines substituted with electron withdrawing groups and **electrolyte** using the same for alkali metal batteries)

IT 955997-47-4P
RL: MOA (Modifier or additive use); SPN (Synthetic preparation); PREP (Preparation); USES (Uses)
(anion receptor comprising aromatic amines substituted with electron withdrawing groups and **electrolyte** using the same for alkali metal batteries)

IT 64696-13-5DP, Bisphenol A ethoxylate dimethacrylate homopolymer, lithium complexes, trifluoromethanesulfonimide-containing
RL: POF (Polymer in formulation); SPN (Synthetic preparation); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(anion receptor comprising aromatic amines substituted with electron withdrawing groups and **electrolyte** using the same for alkali metal batteries)

IT 7439-93-2DP, Lithium, polymer **electrolyte** complexes
RL: SPN (Synthetic preparation); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(anion receptor comprising aromatic amines substituted with electron withdrawing groups and **electrolyte** using the same for alkali metal batteries)

IT 2428-04-8P 838884-10-9P 955997-42-9P 955997-43-0P
955997-44-1P 955997-45-2P 955997-46-3P 955997-48-5P
955997-49-6P 955997-50-9P 955997-51-0P 955997-52-1P
955997-53-2P 955997-54-3P 955997-55-4P 955997-56-5P
955997-57-6P 955997-58-7P 955997-59-8P 955997-60-1P
955997-61-2P 955997-62-3P 955997-63-4P 955997-64-5P
955997-65-6P 955997-66-7P 955997-67-8P 955997-68-9P
955997-69-0P 955997-70-3P 955997-71-4P 955997-72-5P
955997-73-6P 955997-74-7P 955997-75-8P 955997-76-9P
955997-78-1P 955997-79-2P 955997-80-5P 955997-81-6P
955997-82-7P 955997-83-8P 955997-84-9P 955997-85-0P
955997-86-1P
RL: MOA (Modifier or additive use); SPN (Synthetic preparation); PREP (Preparation); USES (Uses)
(anion receptor; anion receptor comprising aromatic amines substituted with electron withdrawing groups and **electrolyte** using the same for alkali metal batteries)

IT 7439-93-2, Lithium 7439-93-2D, Lithium, intercalation compds. with carbon 7440-44-0D, Carbon, intercalation compds. with lithium 7782-42-5, Graphite 7782-42-5D, Graphite, intercalation compds. with lithium
RL: TEM (Technical or engineered material use); USES (Uses)
(anode; anion receptor comprising aromatic amines substituted with electron withdrawing groups and **electrolyte** using the same for alkali metal batteries)

IT 145106-51-0P
RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)
(azidification; anion receptor comprising aromatic amines substituted with electron withdrawing groups and **electrolyte** using the same for alkali metal batteries)

IT 24937-79-9, Poly(vinylidene fluoride)
RL: POF (Polymer in formulation); TEM (Technical or engineered material use); USES (Uses)
(cathode coating; anion receptor comprising aromatic amines

substituted with electron withdrawing groups and **electrolyte** using the same for alkali metal batteries)

IT 25233-30-1, Polyaniline 25948-29-2, Poly(carbon disulfide)
RL: POF (Polymer in formulation); TEM (Technical or engineered material use); USES (Uses)
(cathode; anion receptor comprising aromatic amines substituted with electron withdrawing groups and **electrolyte** using the same for alkali metal batteries)

IT 12031-65-1, Lithium nickel oxide (LiNiO2) 12057-17-9, Lithium manganese oxide (LiMn2O4) 12162-79-7, lithium manganese oxide (LiMnO2) 12190-79-3, cobalt lithium oxide (LiCoO2) 12201-18-2, Lithium molybdenum sulfide (LiMoS2) 55326-82-4, lithium titanium sulfide (LiTiS2) 135573-53-4, Cobalt lithium nickel oxide (Co0-1LiNi0-1O2) 138187-48-1, Lithium vanadium oxide (Li1.2V2O5) 252234-58-5 252234-59-6 256345-13-8, Lithium vanadium oxide (Li2.5V6O13) 600177-48-8 911110-65-1, Lithium niobium selenide (LiNbSe3)
RL: TEM (Technical or engineered material use); USES (Uses)
(cathode; anion receptor comprising aromatic amines substituted with electron withdrawing groups and **electrolyte** using the same for alkali metal batteries)

IT 128-09-6, N-Chlorosuccinimide
RL: RCT (Reactant); RACT (Reactant or reagent)
(chlorination agent; anion receptor comprising aromatic amines substituted with electron withdrawing groups and **electrolyte** using the same for alkali metal batteries)

IT 506-77-4, Cyanogen chloride
RL: RCT (Reactant); RACT (Reactant or reagent)
(cyanation agent; anion receptor comprising aromatic amines substituted with electron withdrawing groups and **electrolyte** using the same for alkali metal batteries)

IT 367-25-9, 2,4-Difluoroaniline
RL: RCT (Reactant); RACT (Reactant or reagent)
(cyanation, chlorination, trifluoroacetylation; anion receptor comprising aromatic amines substituted with electron withdrawing groups and **electrolyte** using the same for alkali metal batteries)

IT 5339-26-4P, 1-(2-Bromoethyl)-4-nitrobenzene
RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)
(dehydrobromination; anion receptor comprising aromatic amines substituted with electron withdrawing groups and **electrolyte** using the same for alkali metal batteries)

IT **78-67-1**, AIBN
RL: CAT (Catalyst use); USES (Uses)
(heat-curing initiator for polymer **electrolyte**; anion receptor comprising aromatic amines substituted with electron withdrawing groups and **electrolyte** using the same for alkali metal batteries)

IT 10036-47-2, Tetrafluorohydrazine
RL: RCT (Reactant); RACT (Reactant or reagent)
(hydrazinolysis reaction; anion receptor comprising aromatic amines substituted with electron withdrawing groups and **electrolyte** using the same for alkali metal batteries)

IT 328-73-4, 1-Iodo-3,5-bis(trifluoromethyl)benzene 2265-93-2, 2,4-Difluoroiodobenzene
RL: RCT (Reactant); RACT (Reactant or reagent)
(hydrazinolysis; anion receptor comprising aromatic amines substituted with electron withdrawing groups and **electrolyte** using the same for alkali metal batteries)

IT 9011-17-0, Vinylidene fluoride-hexafluoropropylene copolymer 25014-41-9, Poly(acrylonitrile)
RL: POF (Polymer in formulation); TEM (Technical or engineered material use); USES (Uses)
(matrix; anion receptor comprising aromatic amines substituted with electron withdrawing groups and **electrolyte** using the same for alkali metal batteries)

IT 1072-71-5, 2,5-Dimercapto-1,3,4-thiadiazole
RL: MOA (Modifier or additive use); USES (Uses)
(mixture with polyaniline; anion receptor comprising aromatic amines substituted with electron withdrawing groups and **electrolyte** using the same for alkali metal batteries)

IT 103-63-9, Phenethyl bromide
RL: RCT (Reactant); RACT (Reactant or reagent)
(nitration; anion receptor comprising aromatic amines substituted with electron withdrawing groups and **electrolyte** using the same for alkali metal batteries)

IT 75-05-8, Acetonitrile 96-47-9, 2-Methyltetrahydrofuran 96-48-0, γ-Butyrolactone 96-49-1, Ethylene carbonate 105-58-8, Diethyl carbonate 107-31-3, Methyl formate 108-32-7, Propylene carbonate 109-87-5, Dimethoxymethane 109-99-9, THF 110-71-4, 1,2-Dimethoxyethane **126-33-0**, Sulfolane 616-38-6, Dimethyl carbonate 646-06-0, 1,3-Dioxolane 872-50-4, N-Methyl-2-pyrrolidinone 1072-47-5, 4-Methyl-1,3-dioxolane 19836-78-3, 3-Methyl-2-oxazolidinone 51667-26-6, Oxazolidinone
RL: TEM (Technical or engineered material use); USES (Uses)
(nonaq. solvent; anion receptor comprising aromatic amines substituted with electron withdrawing groups and **electrolyte** using the same for alkali metal batteries)

IT 84-65-1, Anthraquinone 90-94-8, Michler's ketone 93-97-0, Benzoyl benzoate 119-61-9, Benzophenone 120-51-4, Benzyl benzoate 134-85-0, p-Chlorobenzophenone 492-22-8, Thioxanthone 574-09-4, Ethyl benzoin ether 927-07-1, tert-Butyl **peroxypivalate** 947-19-3, 1-Hydroxycyclohexyl phenyl ketone 2648-61-5, α,α-Dichloroacetophenone 6175-45-7, α,α-Diethoxyacetophenone 6652-28-4, Isopropyl benzoin ether 6652-29-5, Benzoin phenyl ether 7473-98-5, 2-Hydroxy-2-methyl-1-phenyl-1-propanone 24650-42-8, DMPA 27962-49-8 72896-34-5, Chlorothioxanthone 75081-21-9, (Isopropyl)thioxanthone
RL: CAT (Catalyst use); USES (Uses)
(photocuring initiator for polymer **electrolyte**; anion receptor comprising aromatic amines substituted with electron withdrawing groups and **electrolyte** using the same for alkali metal batteries)

IT 9003-11-6D, Ethylene glycol propylene glycol copolymer, di-Bu ether-terminated 24991-55-7, Polyethylene glycol dimethyl ether 24991-61-5, Polypropylene glycol dimethyl ether 26142-30-3, Polypropylene glycol diglycidyl ether 26403-72-5, Polyethylene glycol diglycidyl ether 31885-97-9, Polyethylene glycol dibutyl ether 53609-62-4, Polyethylene glycol diethyl ether 60314-50-3, Polyethylene glycol dipropyl ether 106392-12-5D, Block polyethylene-polypropylene glycol, di-Bu ether-terminated
RL: POF (Polymer in formulation); TEM (Technical or engineered material use); USES (Uses)
(polymer **electrolyte**; anion receptor comprising aromatic amines substituted with electron withdrawing groups and **electrolyte** using the same for alkali metal batteries)

IT 99-35-4, 1,3,5-Trinitrobenzene

RL: RCT (Reactant); RACT (Reactant or reagent)
(reduction; anion receptor comprising aromatic amines substituted with electron withdrawing groups and **electrolyte** using the same for alkali metal batteries)

IT 100-13-0P, 4-Nitrostyrene 13556-15-5P
RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)
(reduction; anion receptor comprising aromatic amines substituted with electron withdrawing groups and **electrolyte** using the same for alkali metal batteries)

IT 9003-07-0, Polypropylene
RL: POF (Polymer in formulation); TEM (Technical or engineered material use); USES (Uses)
(separator; anion receptor comprising aromatic amines substituted with electron withdrawing groups and **electrolyte** using the same for alkali metal batteries)

IT 124-63-0, Methanesulfonyl chloride 358-23-6, Triflic anhydride
RL: RCT (Reactant); RACT (Reactant or reagent)
(sulfonylation agent; anion receptor comprising aromatic amines substituted with electron withdrawing groups and **electrolyte** using the same for alkali metal batteries)

IT 96-50-4, 2-Aminothiazole 109-12-6, 2-Aminopyrimidine 141-86-6, 2,6-Diaminopyridine 328-74-5, 3,5-Bis(trifluoromethyl)aniline 670-96-2, 2-Phenylimidazole 7673-09-8 31230-17-8, 3-Amino-5-methylpyrazole 33228-45-4, 4-Hexylaniline
RL: RCT (Reactant); RACT (Reactant or reagent)
(sulfonylation, cyanation, chlorination, trifluoroacetylation; anion receptor comprising aromatic amines substituted with electron withdrawing groups and **electrolyte** using the same for alkali metal batteries)

IT 108-72-5P, 1,3,5-Triaminobenzene 1520-21-4P, 4-Aminostyrene
RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)
(sulfonylation, cyanation, chlorination, trifluoroacetylation; anion receptor comprising aromatic amines substituted with electron withdrawing groups and **electrolyte** using the same for alkali metal batteries)

IT 108-73-6, 1,3,5-Benzenetriol
RL: RCT (Reactant); RACT (Reactant or reagent)
(sulfonylation; anion receptor comprising aromatic amines substituted with electron withdrawing groups and **electrolyte** using the same for alkali metal batteries)

IT 68602-57-3
RL: RCT (Reactant); RACT (Reactant or reagent)
(trifluoroacetylation agent; anion receptor comprising aromatic amines substituted with electron withdrawing groups and **electrolyte** using the same for alkali metal batteries)

REFERENCE COUNT: 4 THERE ARE 4 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L54 ANSWER 2 OF 12 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 2007:197873 HCAPLUS Full-text
DOCUMENT NUMBER: 146:255355
TITLE: Mesoporous carbon composite, method of preparing the same, and fuel cell using the mesoporous carbon composite
INVENTOR(S): Pak, Chan-Ho; Choi, Yeong-Suk; Chang, Hyuk; Joo, Sang-Hoon
PATENT ASSIGNEE(S): Samsung Sdi Co., Ltd., S. Korea

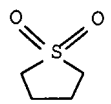
SOURCE: U.S. Pat. Appl. Publ., 16pp.
CODEN: USXXCO
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 2007042268	A1	20070222	US 2006-443165	200605 31
KR 2007021846	A	20070223	KR 2005-76542	200508 20
CN 1917258	A	20070221	CN 2006-10087647	200605 31
JP 2007055882	A	20070308	JP 2006-152551	200605 31

PRIORITY APPLN. INFO.: KR 2005-76542 A 200508 20

AB A mesoporous carbon composite includes mesoporous carbon having mesopores; a conductive polymer coated on only an outer surface of the mesoporous carbon; and an organic **electrolyte** comprising a **lithium salt** and an organic solvent. The mesoporous carbon composite may be prepared by impregnating an ordered mesoporous silica (OMS) with a carbon precursor mixture comprising a carbon precursor, an acid, and a solvent; heat-treating and carbonizing the impregnated OMS to form an OMS-carbon composite; mixing the OMS-carbon composite with a monomer that forms a conductive polymer and a solvent to provide a surface of the OMS-carbon composite with the monomer that forms a conductive polymer; polymerizing the monomer to obtain a conductive polymer-coated OMS-carbon composite; removing the OMS from the conductive polymer-coated OMS-carbon composite to obtain a conductive polymer-coated mesoporous carbon; and doping the conductive polymer-coated mesoporous carbon with an organic **electrolyte** comprising a **lithium salt** and an organic solvent to form the mesoporous carbon composite. A supported catalyst contains the mesoporous carbon composite, and a fuel cell uses an electrode containing the mesoporous carbon composite.

IT **126-33-0**, Sulfolane
RL: NUU (Other use, unclassified); USES (Uses)
(solvent; mesoporous carbon composite, method of preparing the same, and fuel cell using the mesoporous carbon composite)
RN 126-33-0 HCAPLUS
CN Thiophene, tetrahydro-, 1,1-dioxide (CA INDEX NAME)



INCL 429213000; 429232000; 252182100; 502159000; 502180000
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
IT 7722-84-1, Hydrogen **peroxide**, reactions

RL: RGT (Reagent); RACT (Reactant or reagent)
(polymerization initiator; mesoporous carbon composite, method of preparing the same, and fuel cell using the mesoporous carbon composite)

IT 110-71-4 **126-33-0**, Sulfolane 73506-93-1, Diethoxyethane
RL: NUU (Other use, unclassified); USES (Uses)
(solvent; mesoporous carbon composite, method of preparing the same, and fuel cell using the mesoporous carbon composite)

L54 ANSWER 3 OF 12 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 2005:735154 HCAPLUS Full-text
DOCUMENT NUMBER: 143:196855
TITLE: Protected active metal electrode and battery cell structures with nonaqueous interlayer architecture
INVENTOR(S): Visco, Steven J.; Katz, Bruce D.; Nimon, Yevgeniy S.; De Jonghe, Lutgard C.
PATENT ASSIGNEE(S): Polyplus Battery Company, USA
SOURCE: U.S. Pat. Appl. Publ., 20 pp.
CODEN: USXXCO
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

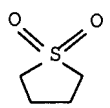
PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 2005175894	A1	20050811	US 2004-824944	20040414
US 7282295	B2	20071016		
AU 2004316638	A1	20050909	AU 2004-316638	20041008
CA 2555637	A1	20050909	CA 2004-2555637	20041008
WO 2005083829	A2	20050909	WO 2004-US33371	20041008
WO 2005083829	A3	20060504		
W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW				
RW: BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG				
EP 1714349	A2	20061025	EP 2004-794655	20041008
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR, BG, CZ, EE, HU, PL, SK, HR				
CN 1938895	A	20070328	CN 2004-80042697	

					200410 08
BR 2004018500	A	20070515	BR 2004-18500		200410 08
JP 2007524204	T	20070823	JP 2006-552102		200410 08
MX 2006PA09007	A	20061020	MX 2006-PA9007		200608 07
KR 2007004670	A	20070109	KR 2006-717692		200608 31
PRIORITY APPLN. INFO.:			US 2004-542532P	P	200402 06
			US 2004-548231P	P	200402 27
			US 2004-824944	A	200404 14
			WO 2004-US33371	W	200410 08

AB The invention concerns active metal and active metal intercalation electrode structures and battery cells having ionically conductive protective architecture including an active metal (e.g., lithium) conductive impervious layer separated from the electrode (anode) by a porous separator impregnated with a non-aqueous **electrolyte** (anolyte). This protective architecture prevents the active metal from deleterious reaction with the environment on the other (cathode) side of the impervious layer, which may include aqueous or nonaq. liquid **electrolytes** (catholytes) and/or a variety electrochem. active materials, including liquid, solid and gaseous oxidizers. Safety additives and designs that facilitate manufacture are also provided.

IT **126-33-0**, Sulfolane
RL: DEV (Device component use)
(protected active metal electrode and battery cell structures with nonaq. interlayer architecture)

RN 126-33-0 HCAPLUS
CN Thiophene, tetrahydro-, 1,1-dioxide (CA INDEX NAME)



IC ICM H01M004-60
INCL 429212000
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 72
IT Primary **batteries**
Secondary **batteries**

(**lithium**; protected active metal electrode and battery cell structures with nonaq. interlayer architecture)

IT Battery anodes
Battery **electrolytes**
Ceramics
Gelation agents
Glass ceramics
Ionic liquids
Oxidizing agents
Polymerization catalysts
Primary batteries
Primary battery separators
Seawater
Secondary batteries
(protected active metal electrode and battery cell structures with nonaq. interlayer architecture)

IT 7446-09-5, Sulfur dioxide, processes 7632-00-0, Sodium nitrite 7722-84-1, Hydrogen **peroxide**, processes 7757-83-7, Sodium sulfite 7758-09-0, Potassium nitrite 7782-44-7, Oxygen, processes 10102-44-0, Nitrogen dioxide, processes 10117-38-1, Potassium sulfite 14915-07-2, **Peroxide**
RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); PROC (Process)
(protected active metal electrode and battery cell structures with nonaq. interlayer architecture)

IT 64-19-7, Acetic acid, uses 71-47-6, Formate, uses 79-20-9, Methyl acetate 96-47-9, 2-Methyltetrahydrofuran 96-49-1, Ethylene carbonate 105-58-8, Diethyl carbonate 107-31-3, Methyl formate 108-32-7, Propylene carbonate 109-99-9, Thf, uses 110-71-4, 1,2-Dimethoxyethane **126-33-0**, Sulfolane 546-89-4, Lithium acetate 616-38-6, Dimethyl carbonate 623-53-0, Ethyl methyl carbonate 646-06-0, 1,3-Dioxolane 1301-96-8, Silver oxide (AgO) 1310-65-2, Lithium hydroxide 1332-37-2, Iron oxide, uses 1335-25-7, Lead oxide 7429-90-5, Aluminum, uses 7439-93-2, Lithium, uses 7439-95-4, Magnesium, uses 7440-22-4, Silver, uses 7440-31-5, Tin, uses 7440-36-0, Antimony, uses 7440-43-9, Cadmium, uses 7440-44-0, Carbon, uses 7440-55-3, Gallium, uses 7440-66-6, Zinc, uses 7440-69-9, Bismuth, uses 7440-70-2, Calcium, uses 7440-74-6, Indium, uses 7447-41-8, Lithium chloride, uses 7550-35-8, Lithium bromide 7647-01-0, Hydrochloric acid, uses 7664-38-2, Phosphoric acid, uses 7664-93-9, Sulfuric acid, uses 7719-09-7, Thionyl chloride 7791-03-9, Lithium perchlorate 10377-51-2, Lithium iodide 11129-60-5, Manganese oxide 12026-04-9, Nickel hydroxide oxide Niooh 12124-97-9, Ammonium bromide 12125-02-9, Ammonium chloride, uses 14283-07-9, Lithium tetrafluoroborate 16749-13-6D, Phosphonium, compound 16969-45-2D, Pyridinium, derivs. 17009-90-4D, Imidazolium, derivs. 21324-40-3, Lithium hexafluorophosphate 25067-64-5 29935-35-1, Lithium hexafluoroarsenate 33454-82-9, Lithium triflate 74432-42-1, Lithium polysulfide 90076-65-6 132843-44-8 155371-19-0, 1-Ethyl-3-methylimidazolium hexafluorophosphate 174501-64-5, 1-Butyl-3-methylimidazolium hexafluorophosphate 244193-50-8, 1Hexyl-3-methylimidazolium tetrafluoroborate 328090-25-1, 1-Ethyl-3-methylimidazolium tosylate
RL: DEV (Device component use)
(protected active metal electrode and battery cell structures with nonaq. interlayer architecture)

L54 ANSWER 4 OF 12 HCAPLUS COPYRIGHT 2007 ACS on STN

ACCESSION NUMBER: 2005:155490 HCAPLUS Full-text
DOCUMENT NUMBER: 142:264348
TITLE: **Electrolyte** for rechargeable **lithium battery**
INVENTOR(S): Lee, Yong-Beom; Song, Eui-Hwan; Kim, Kwang-Sup; Earmme, Tae-Shik; Kim, You-Mee
PATENT ASSIGNEE(S): Samsung SDI Co., Ltd., S. Korea
SOURCE: Eur. Pat. Appl., 32 pp.
CODEN: EPXXDW
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
EP 1508934	A1	20050223	EP 2004-90320	200408 19
EP 1508934	B1	20070228		
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR, BG, CZ, EE, HU, PL, SK, HR				
KR 2005020067	A	20050304	KR 2003-57716	200308 20
KR 2005078443	A	20050805	KR 2004-5874	200401 29
AT 355629	T	20060315	AT 2004-90320	200408 19
JP 2005072003	A	20050317	JP 2004-241017	200408 20
US 2005084765	A1	20050421	US 2004-924248	200408 20
CN 1612405	A	20050504	CN 2004-10098111	200408 20

PRIORITY APPLN. INFO.:			
	KR 2003-57716	A	200308 20
	KR 2004-5874	A	200401 29

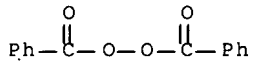
OTHER SOURCE(S): MARPAT 142:264348

AB Disclosed is an **electrolyte** for a rechargeable **lithium battery**, including a mixture of organic solvents including a cyclic solvent and a nitrile-based solvent represented by the formula R-C.tplbond.N (R is from C1-10 aliphatic hydrocarbons, C1-10 halogenated aliphatic hydrocarbons, C6-10 aromatic hydrocarbons, and C6-10 halogenated aromatic hydrocarbons) and a **lithium salt**.

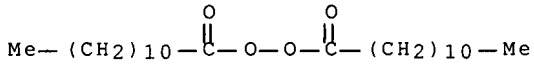
IT **94-36-0**, Dibenzoyl **peroxide**, processes
105-74-8, Dilauroyl **peroxide** **3006-82-4**,
tert-Butyl **peroxy**-2-ethyl hexanoate **4419-11-8**,
2,2'-**Azobis**(2,4-dimethylvaleronitrile) **15520-11-3**

, Di(4-tert-butylcyclohexyl)**peroxydicarbonate**
RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); PROC (Process)
(**electrolyte** for rechargeable **lithium battery**)

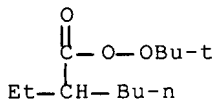
RN 94-36-0 HCAPLUS
CN Peroxide, dibenzoyl (CA INDEX NAME)



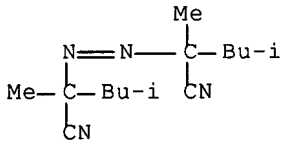
RN 105-74-8 HCAPLUS
CN Peroxide, bis(1-oxododecyl) (CA INDEX NAME)



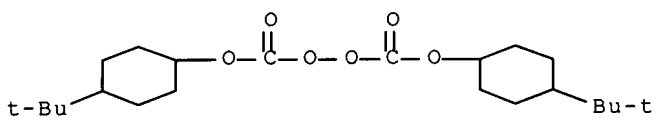
RN 3006-82-4 HCAPLUS
CN Hexaneperoxoic acid, 2-ethyl-, 1,1-dimethylethyl ester (CA INDEX NAME)



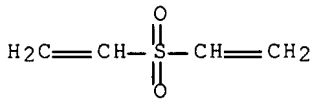
RN 4419-11-8 HCAPLUS
CN Pentanenitrile, 2,2'-(1,2-diazenediyl)bis[2,4-dimethyl- (CA INDEX NAME)



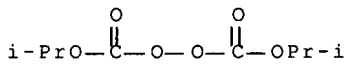
RN 15520-11-3 HCAPLUS
CN Peroxydicarbonic acid, C,C'-bis[4-(1,1-dimethylethyl)cyclohexyl] ester (CA INDEX NAME)



IT **77-77-0**, DiVinyl sulfone **105-64-6**, Di-**isopropylperoxydicarbonate**
RL: MOA (Modifier or additive use); USES (Uses)
(**electrolyte** for rechargeable **lithium battery**)
RN 77-77-0 HCAPLUS
CN Ethene, 1,1'-sulfonylbis- (CA INDEX NAME)



RN 105-64-6 HCAPLUS
CN Peroxydicarbonic acid, C,C'-bis(1-methylethyl) ester (CA INDEX NAME)



IC ICM H01M010-40
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 38
ST **electrolyte** rechargeable **lithium battery**
IT Nitriles, uses
RL: DEV (Device component use); USES (Uses)
(aliphatic, C1-10; **electrolyte** for rechargeable **lithium battery**)
IT Nitriles, uses
RL: DEV (Device component use); USES (Uses)
(aromatic, C6-10; **electrolyte** for rechargeable **lithium battery**)
IT Battery **electrolytes**
(**electrolyte** for rechargeable **lithium battery**)
IT Lactones
RL: DEV (Device component use); USES (Uses)
(**electrolyte** for rechargeable **lithium battery**)
IT Secondary **batteries**
(**lithium**; **electrolyte** for rechargeable **lithium battery**)
IT **Peroxides**, uses
RL: MOA (Modifier or additive use); USES (Uses)
(organic; **electrolyte** for rechargeable **lithium battery**)
IT **94-36-0**, Dibenzoyl **peroxide**, processes
105-74-8, Dilauroyl **peroxide** 107-71-1, tert-**Butylperoxy** acetate 109-13-7, tert-**Butylperoxyisobutyrate** 110-22-5, Diacetyl **peroxide** 614-45-9, tert-**Butylperoxy** benzoate 686-31-7, tert-**Amylperoxy** 2-ethylhexanoate 927-07-1, tert-Butyl

peroxypivalate 2372-21-6, tert-Butyl **peroxy** isopropyl carbonate **3006-82-4**, tert-Butyl **peroxy** -2-ethyl hexanoate 3851-87-4, Bis(3,5,5-trimethyl)hexanoyl **peroxide 4419-11-8**, 2,2'-**Azobis** (2,4-dimethylvaleronitrile) 13122-18-4, tert-**Butylperoxy** 3,5,5-trimethylhexanoate 15518-51-1, Diethylene glycol bis(tert-**butylperoxycarbonate**) **15520-11-3**, Di(4-tert-butylcyclohexyl)**peroxydicarbonate** 25551-14-8 26748-38-9, tert-Butyl **peroxy** neoheptanoate 26748-41-4, tert-Butyl **peroxy** neodecanoate 29240-17-3, tert-Amyl **peroxypivalate** 34443-12-4, tert-Butyl **peroxy** 2-ethylhexyl carbonate 36536-42-2, 1,6-Hexanediol bis(tert-butyl **peroxycarbonate**) 51240-95-0, 1,1,3,3-Tetramethylbutyl **peroxy** neodecanoate 51938-28-4, tert-**Hexylperoxypivalate** 52238-68-3, Bis(3-methoxybutyl) **peroxydicarbonate** 68860-54-8 96989-15-0 845717-44-4
RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); PROC (Process)
(**electrolyte** for rechargeable **lithium** **battery**)

IT 79-20-9, Methyl acetate 96-48-0, γ-Butyrolactone 96-49-1, Ethylene carbonate 105-58-8, Diethyl carbonate 106-70-7, Methyl hexanoate 107-12-0, Propionitrile 107-31-3, Methyl formate 108-29-2, γ-Valerolactone 108-32-7, Propylene carbonate 109-74-0, Butyronitrile 110-59-8, Valeronitrile 124-12-9, Caprylonitrile 140-29-4, Phenylacetonitrile 141-78-6, Ethyl acetate, uses 326-62-5, 2-FluoroPhenylacetonitrile 394-47-8, 2-Fluorobenzonitrile 459-22-3, 4-FluoroPhenylacetonitrile 502-44-3, ε-Caprolactone 542-28-9, δ-Valerolactone 542-52-9, Dibutyl carbonate 616-38-6, Dimethyl carbonate 623-53-0, Ethyl methyl carbonate 623-96-1, Dipropyl carbonate 629-08-3, Heptanenitrile 630-18-2, tert-Butyl cyanide 695-06-7, γ-Caprolactone 766-05-2, Cyclohexanecarbonitrile 1194-02-1, 4-Fluorobenzonitrile 4254-02-8, Cyclopentanecarbonitrile 4437-85-8, Butylene carbonate 7439-93-2D, **Lithium, salt** 7791-03-9, Lithium perchlorate 12190-79-3, Cobalt lithium oxide (CoLiO2) 14024-11-4, Lithium tetrachloroaluminate 14283-07-9, Lithium tetrafluoroborate 18424-17-4, Lithium hexafluoroantimonate 21324-40-3, Lithium hexafluorophosphate 29935-35-1, Lithium hexafluoroarsenate 33454-82-9, Lithium triflate 57381-51-8, 4-Chloro-2-fluoro-benzonitrile 60702-69-4, 2-Chloro-4-fluoro-benzonitrile 90076-65-6 90240-74-7 127813-79-0 132843-44-8 179802-95-0, Cobalt lithium manganese nickel oxide (Co0.1LiMn0.1Ni0.8O2) 845717-45-5
RL: DEV (Device component use); USES (Uses)
(**electrolyte** for rechargeable **lithium** **battery**)

IT 75-05-8, Acetonitrile, uses **77-77-0**, DiVinyl sulfone **105-64-6**, Di-**isopropylperoxydicarbonate** 628-73-9, Capronitrile 872-36-6, Vinylene carbonate 3741-38-6, Ethylene sulfite 16111-62-9, Bis(2-ethylhexyl) **peroxydicarbonate** 22537-94-6 71331-99-2, Bis(4-tert-butylcyclohexyl)**peroxycarbonate** 114435-02-8, Fluoroethylene carbonate
RL: MOA (Modifier or additive use); USES (Uses)
(**electrolyte** for rechargeable **lithium** **battery**)

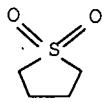
REFERENCE COUNT: 18 THERE ARE 18 CITED REFERENCES AVAILABLE

FOR THIS RECORD. ALL CITATIONS AVAILABLE
IN THE RE FORMAT

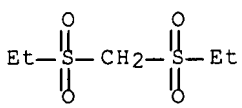
L54 ANSWER 5 OF 12 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 2004:1042417 HCAPLUS Full-text
DOCUMENT NUMBER: 142:300815
TITLE: New **lithium salts** for rechargeable **battery electrolytes**
AUTHOR(S): Mandal, Braja; Sooksimuang, Thanasat; Griffin, Brian; Padhi, Akshaya; Filler, Robert
CORPORATE SOURCE: Department of Biological, Chemical and Physical Sciences, Illinois Institute of Technology, Chicago, IL, 60616, USA
SOURCE: Solid State Ionics (2004), 175(1-4), 267-272
CODEN: SSIOD3; ISSN: 0167-2738
PUBLISHER: Elsevier B.V.
DOCUMENT TYPE: Journal
LANGUAGE: English

AB The facile syntheses of new, low-cost, non-fluorinated, sulfonyl-substituted imide and methide **lithium salts** are described. These salts, prepared for potential application in **lithium** ion rechargeable **battery electrolytes**, exhibit very good electrochem. and thermal behavior. While the salts are very soluble in DMSO and sulfolane, their solubilities in standard carbonate solvents is less than adequate for battery operations. Mol. modifications to improve solubility are in progress.

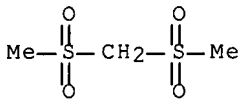
IT **126-33-0**, Sulfolane
RL: NUU (Other use, unclassified); PRP (Properties); USES (Uses)
(new **lithium salts** for rechargeable **battery electrolytes**)
RN 126-33-0 HCAPLUS
CN Thiophene, tetrahydro-, 1,1-dioxide (CA INDEX NAME)



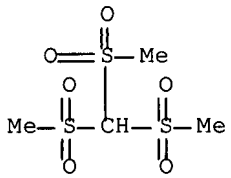
IT **1070-92-4P 1750-62-5P 4610-99-5P 90325-14-7P**
RL: PRP (Properties); RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)
(new **lithium salts** for rechargeable **battery electrolytes**)
RN 1070-92-4 HCAPLUS
CN Ethane, 1,1'-[methylenebis(sulfonyl)]bis- (CA INDEX NAME)



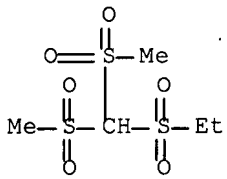
RN 1750-62-5 HCAPLUS
CN Methane, bis(methylsulfonyl)- (CA INDEX NAME)



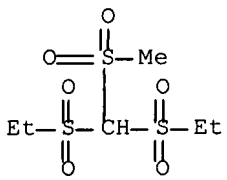
RN 4610-99-5 HCAPLUS
CN Methane, tris(methylsulfonyl)- (7CI, 8CI, 9CI) (CA INDEX NAME)



RN 90325-14-7 HCAPLUS
CN Ethane, [[bis(methylsulfonyl)methyl]sulfonyl]- (9CI) (CA INDEX NAME)



IT **59099-56-8P**
RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation)
(new **lithium salts** for rechargeable **battery electrolytes**)
RN 59099-56-8 HCAPLUS
CN Ethane, 1,1'-[[(methylsulfonyl)methylene]bis(sulfonyl)]bis- (9CI) (CA INDEX NAME)



CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 76
ST synthesis **lithium salt** imide methide secondary

battery **electrolyte** cond

IT Stability
(hydrolytic, thermal, electrochem., of **lithium** imide **salts**; new **lithium salts** for rechargeable **battery electrolytes**)

IT Secondary **batteries**
(**lithium**; new **lithium salts** for rechargeable **battery electrolytes**)

IT Alkylation
Battery electrolytes
Lithiation
(new **lithium salts** for rechargeable **battery electrolytes**)

IT Sulfones
RL: PRP (Properties); RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)
(new **lithium salts** for rechargeable **battery electrolytes**)

IT Solubility
(of **lithium** imide **salts** in carbonate solvents, DMSO, and sulfolane; new **lithium salts** for rechargeable **battery electrolytes**)

IT Electric impedance
(of **lithium salt** solns. in DMSO; new **lithium salts** for rechargeable **battery electrolytes**)

IT Electric conductivity
(of salts in solvents; new **lithium salts** for rechargeable **battery electrolytes**)

IT Imides
Sulfonic acids, preparation
RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation)
(sulfonimides; new **lithium salts** for rechargeable **battery electrolytes**)

IT Decomposition
(temperature of; new **lithium salts** for rechargeable **battery electrolytes**)

IT 67-68-5, DMSO, uses 96-49-1, Ethylene carbonate **126-33-0**, Sulfolane 616-38-6, Dimethyl carbonate
RL: NUU (Other use, unclassified); PRP (Properties); USES (Uses)
(new **lithium salts** for rechargeable **battery electrolytes**)

IT 21324-40-3, Lithium hexafluorophosphate
RL: PRP (Properties)
(new **lithium salts** for rechargeable **battery electrolytes**)

IT **1070-92-4P 1750-62-5P 4610-99-5P 90325-14-7P**
RL: PRP (Properties); RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)
(new **lithium salts** for rechargeable **battery electrolytes**)

IT **59099-56-8P** 133395-17-2P 259106-93-9P 847684-90-6P 847684-93-9P 847684-94-0P 847684-96-2P
RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation)
(new **lithium salts** for rechargeable **battery electrolytes**)

IT 75-08-1, Ethanethiol 110-88-3, 1,3,5-Trioxane, reactions
124-63-0, Methanesulfonyl chloride 420-04-2, Cyanamide 594-44-5, Ethanesulfonyl chloride 598-30-1, sec-Butyl **Lithium** 917-54-4, Methyl **lithium** 1310-65-2, Lithium hydroxide 1618-26-4, Bis(methylthio)methane 7646-69-7, Sodium hydride (NaH) 7722-84-1, Hydrogen **peroxide**, reactions
RL: RCT (Reactant); RACT (Reactant or reagent)
(new **lithium salts** for rechargeable **battery electrolytes**)

IT 15873-42-4P, Imidodisulfuryl chloride 34782-37-1P 34782-38-2P
RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)
(new **lithium salts** for rechargeable **battery electrolytes**)

REFERENCE COUNT: 11 THERE ARE 11 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L54 ANSWER 6 OF 12 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 2004:161244 HCAPLUS Full-text
DOCUMENT NUMBER: 140:202430
TITLE: Salts of pentacyclic or tetrapentalene derived anions, and their uses as ionic conductive materials
INVENTOR(S): Armand, Michel; Michot, Christophe; Gauthier, Michel; Choquette, Yves
PATENT ASSIGNEE(S): Hydro-Quebec, Can.; Centre National De La Recherche Scientifique (CNRS)
SOURCE: Eur. Pat. Appl., 33 pp.
CODEN: EPXXDW
DOCUMENT TYPE: Patent
LANGUAGE: French
FAMILY ACC. NUM. COUNT: 5
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
EP 1391952	A2	20040225	EP 2003-292436	199712 30
R: DE, FR, GB, IT				
CA 2194127	A1	19980630	CA 1996-2194127	199612 30
CA 2199231	A1	19980905	CA 1997-2199231	199703 05
EP 850933	A1	19980701	EP 1997-403188	199712 30
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO				
CA 2248304	A1	19980709	CA 1997-2248304	199712 30
CA 2248304	C	20071113		
EP 889863	A2	19990113	EP 1997-951051	199712 30

EP 889863	B1	20030507		
R: DE, FR, GB, IT				
EP 890176	A1	19990113	EP 1997-951052	199712 30
EP 890176	B1	20010620		
R: DE, FR, GB, IT				
JP 2000508114	T	20000627	JP 1998-529517	199712 30
JP 2000508346	T	20000704	JP 1998-529516	199712 30
JP 2000508676	T	20000711	JP 1998-529514	199712 30
JP 2000508677	T	20000711	JP 1998-529515	199712 30
JP 2000508678	T	20000711	JP 1998-529518	199712 30
JP 2002514245	T	20020514	JP 1998-529513	199712 30
US 6120696	A	20000919	US 1998-125792	199808 28
US 6171522	B1	20010109	US 1998-101811	199811 19
US 6333425	B1	20011225	US 1998-101810	199811 19
US 6228942	B1	20010508	US 1998-125798	199812 02
US 6395367	B1	20020528	US 1998-125799	199812 02
US 6319428	B1	20011120	US 1998-125797	199812 03
US 6365068	B1	20020402	US 2000-609362	200006 30
US 6576159	B1	20030610	US 2000-638793	200008 09
US 2001024749	A1	20010927	US 2001-826941	200104 06
US 6506517	B2	20030114		
US 2002009650	A1	20020124	US 2001-858439	200105 16
US 2002102380	A1	20020801	US 2002-107742	200203 27
US 6835495	B2	20041228		

US 2003052310	A1	20030320	US 2002-253035	200209 24
US 2003066988	A1	20030410	US 2002-253970	200209 24
US 2005074668	A1	20050407	US 2004-789453	200402 27
US 2005123831	A1	20050609	US 2004-926283	200408 25
PRIORITY APPLN. INFO.:			CA 1996-2194127	A 199612 30
			CA 1997-2199231	A 199703 05
			EP 1997-403188	A3 199712 30
			WO 1997-CA1008	W 199712 30
			WO 1997-CA1009	W 199712 30
			WO 1997-CA1010	W 199712 30
			WO 1997-CA1011	W 199712 30
			WO 1997-CA1012	W 199712 30
			WO 1997-CA1013	W 199712 30
			US 1998-101810	A3 199811 19
			US 1998-101811	A3 199811 19
			US 1998-125798	A3 199812 02

US 1998-125799	A3	19981202
US 1998-125797	A1	19981203
US 2000-638793	A1	20000809
US 2001-858439	A1	20010516
US 2002-107742	A1	20020327

AB This invention describes ionic compds. where the anionic charge is delocalized. One compound of the invention contains an anionic part associated with at least one mono- or multivalent cationic part Mm+, in a number sufficient to ensure electronic neutrality of the material. M can be a hydronium, nitrosyl NO+, an ammonium NH4+, a metallic cation with valence m, an organic cation having a valence m, or an organometallic cation having valence m. The anionic charge is carried by a new pentacyclic moiety or derivative of tetrapentalene carrying electroattractive substituents. The compds. are used notably for ionic conduction, electronic conductors, dyes and colorants, and catalysts for diverse chemical reactions. They can also be used as **electrolytes** in fuel cells and batteries.

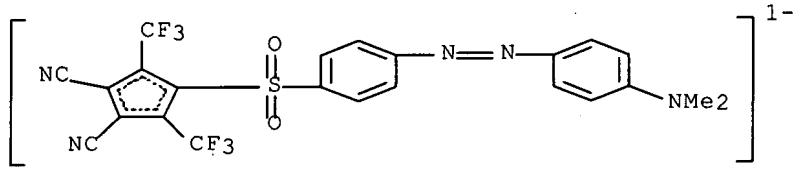
IT **210469-91-3P**
RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation)
(salts of pentacyclic or tetrapentalene derived anions, and their uses as ionic conductive materials)

RN 210469-91-3 HCAPLUS

CN 1-Butanaminium, N,N,N-tributyl-, salt with 4-[[4-[[4-(dimethylamino)phenyl]azo]phenyl]sulfonyl]-3,5-bis(trifluoromethyl)-1,3-cyclopentadiene-1,2-dicarbonitrile (1:1) (9CI) (CA INDEX NAME)

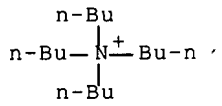
CM 1

CRN 210469-90-2
CMF C23 H14 F6 N5 O2 S

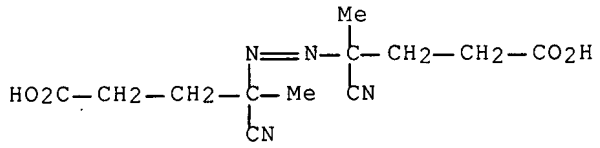


CM 2

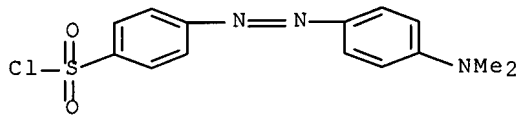
CRN 10549-76-5
CMF C16 H36 N



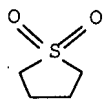
IT **2638-94-0**, 4,4'-**Azobis**(4-cyanovaleric acid)
56512-49-3, 4-(Dimethylamino)**azobenzene**
-4'-sulfonyl chloride
RL: RCT (Reactant); RACT (Reactant or reagent)
(**salts** of pentacyclic or tetrapentalene derived anions, and their uses as ionic conductive materials)
RN 2638-94-0 HCAPLUS
CN Pentanoic acid, 4,4'-(1,2-diazenediyl)bis[4-cyano- (CA INDEX NAME)



RN 56512-49-3 HCAPLUS
CN Benzenesulfonyl chloride, 4-[2-[4-(dimethylamino)phenyl]diazenyl]- (CA INDEX NAME)



IT **126-33-0D**, Sulfolane, derivs.
RL: NUU (Other use, unclassified); USES (Uses)
(solvent for title compds.; salts of pentacyclic or tetrapentalene derived anions, and their uses as ionic conductive materials)
RN 126-33-0 HCAPLUS
CN Thiophene, tetrahydro-, 1,1-dioxide (CA INDEX NAME)



IC ICM H01M006-16
ICS H01M010-40
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

Section cross-reference(s): 27, 28, 29, 35, 76

ST pentacyclic tetrapentalene salt charge delocalized anion ionic conduction; alkali alk earth transition metal salt heterocyclic **electrolyte** polymer; electrochem cell fuel polyelectrolyte cond soly catalysis fluoropolymer polysiloxane

IT Optical absorption
(by polymer **electrolytes**; salts of pentacyclic or tetrapentalene derived anions, and their uses as ionic conductive materials)

IT Carbon black, uses
RL: DEV (Device component use); PRP (Properties); USES (Uses)
(composite electrodes with soft polymer or LiCoO2 and polymer gel **electrolytes**, or with acetylene black, VO2 and PEO; salts of pentacyclic or tetrapentalene derived anions, and their uses as ionic conductive materials)

IT Polyoxyalkylenes, processes
RL: PEP (Physical, engineering or chemical process); PRP (Properties); PYP (Physical process); PROC (Process)
(**electrolyte** complexes with **lithium salts**, carbon blacks, (1,2,3-triazolium) ionic liqs., and other materials; salts of pentacyclic or tetrapentalene derived anions, and their uses as ionic conductive materials)

IT Phosphates, uses
RL: DEV (Device component use); TEM (Technical or engineered material use); USES (Uses)
(iron, manganese, and **lithium** -containing; **salts** of pentacyclic or tetrapentalene derived anions, and their uses as ionic conductive materials)

IT Open circuit potential
(of dye-sensitized solar cells with imidazolium-triazole-iodide **electrolytes**; salts of pentacyclic or tetrapentalene derived anions, and their uses as ionic conductive materials)

IT Ionic conductivity
(of **lithium salts** in polymer **electrolytes** and polymer gel **electrolytes**; salts of pentacyclic or tetrapentalene derived anions, and their uses as ionic conductive materials)

IT Cyclic voltammetry
(of secondary battery cells with polymer gel **electrolytes**; salts of pentacyclic or tetrapentalene derived anions, and their uses as ionic conductive materials)

IT Silicates, uses
RL: DEV (Device component use); TEM (Technical or engineered material use); USES (Uses)
(phospho-, iron, manganese, and **lithium** -containing; **salts** of pentacyclic or tetrapentalene derived anions, and their uses as ionic conductive materials)

IT Aldol condensation catalysts
Antistatic agents
Coloring materials
Corrosion inhibitors
Dyes
Electron delocalization
Esterification
Friedel-Crafts reaction catalysts
Fuel cell separators
Heterojunction solar cells
Ionic liquids
Michael reaction catalysts
Plasticizers

Polyelectrolytes
Polymer **electrolytes**
Polymerization catalysts
Solubility
Substitution reaction, nucleophilic
Surfactants
(salts of pentacyclic or tetrapentalene derived anions, and their uses as ionic conductive materials)

IT Phosphates, uses
RL: DEV (Device component use); TEM (Technical or engineered material use); USES (Uses)
(silico-, iron, manganese, and **lithium** -containing; **salts** of pentacyclic or tetrapentalene derived anions, and their uses as ionic conductive materials)

IT 25322-68-3, Polyethylene oxide
RL: PEP (Physical, engineering or chemical process); PRP (Properties); PYP (Physical process); PROC (Process)
(**electrolyte** complexes with **lithium** **salts**, carbon blacks, (1,2,3-triazolium) ionic liqs., and other materials; salts of pentacyclic or tetrapentalene derived anions, and their uses as ionic conductive materials)

IT 210289-62-6P
RL: PRP (Properties); PUR (Purification or recovery); SPN (Synthetic preparation); PREP (Preparation)
(**electrolyte**, ionic liquid; salts of pentacyclic or tetrapentalene derived anions, and their uses as ionic conductive materials)

IT 96-49-1, Ethylene carbonate 108-32-7, Propylene carbonate
RL: PRP (Properties)
(in gel polymer **electrolyte**; salts of pentacyclic or tetrapentalene derived anions, and their uses as ionic conductive materials)

IT 107-13-1, Acrylonitrile, reactions
RL: PRP (Properties); RCT (Reactant); RACT (Reactant or reagent)
(in gel polymer **electrolyte**; salts of pentacyclic or tetrapentalene derived anions, and their uses as ionic conductive materials)

IT 661461-54-7P
RL: PRP (Properties); PUR (Purification or recovery); SPN (Synthetic preparation); PREP (Preparation)
(pure and polymer **electrolytes** with polyethylene oxide; salts of pentacyclic or tetrapentalene derived anions, and their uses as ionic conductive materials)

IT 7580-67-8, **Lithium** hydride
RL: CAT (Catalyst use); RCT (Reactant); RACT (Reactant or reagent); USES (Uses)
(**salts** of pentacyclic or tetrapentalene derived anions, and their uses as ionic conductive materials)

IT 12190-79-3, Cobalt **lithium** oxide (CoLiO2)
RL: DEV (Device component use); PRP (Properties); USES (Uses)
(**salts** of pentacyclic or tetrapentalene derived anions, and their uses as ionic conductive materials)

IT 289-06-5D, Thiadiazole, anionic derivs. 289-95-2D, Pyrimidine, anionic derivs. 290-37-9D, Pyrazine, anionic derivs. 7439-93-2, **Lithium**, uses 11120-54-0D, Oxadiazole, anionic derivs.
RL: DEV (Device component use); TEM (Technical or engineered material use); USES (Uses)
(**salts** of pentacyclic or tetrapentalene derived anions, and their uses as ionic conductive materials)

IT **210469-91-3P** 661461-52-5P

RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation)
(salts of pentacyclic or tetrapentalene derived anions, and their uses as ionic conductive materials)

IT 76-05-1, reactions 78-94-4, Methyl vinyl ketone, reactions 94-41-7 98-88-4, Benzoyl chloride 100-52-7, Benzaldehyde, reactions 100-66-3, Anisole, reactions 102-52-3, 1,1,3,3-Tetramethoxypropane 106-20-7, Di-2-ethylhexylamine 108-24-7, Acetic anhydride 109-72-8, Butyllithium, reactions 110-61-2, Succinic dinitrile 112-76-5, Stearic acid chloride 121-44-8, Triethylamine, reactions 143-33-9, Sodium cyanide 144-55-8, Sodium bicarbonate, reactions 303-04-8, 2,3-Dichloro-Hexafluoro-2-butene 326-90-9, 4,4,4-Trifluoro-1-(2-furyl)-1,3-butanedione 326-91-0 375-72-4, Perfluorobutanesulfonyl fluoride 407-38-5, 2,2,2-Trifluoroethyl trifluoroacetate 421-83-0, Trifluoromethanesulfonyl chloride 497-19-8, Sodium carbonate, reactions 538-75-0, Dicyclohexylcarbodiimide 542-92-7, Cyclopentadiene, reactions 554-13-2, **Lithium** carbonate 584-08-7, Potassium carbonate 676-58-4, Methylmagnesium chloride 677-25-8, Ethenesulfonyl fluoride 692-50-2 693-13-0, 1,3-Diisopropylcarbodiimide 764-93-2, 1-Decyne 765-12-8, Triethylene glycol divinyl ether 917-70-4, Lanthanum acetate 937-14-4, 3-**Chloroperoxybenzoic** acid 1000-84-6 1068-57-1, Acetylhydrazide 1122-28-7, 4,5-Dicyanoimidazole 1310-58-3, Potassium hydroxide, reactions 1522-22-1, Hexafluoroacetylacetone 1643-19-2, Tetrabutylammonium bromide 1648-99-3 2094-98-6, 1,1'-**Azobis**(cyclohexanecarbonitrile) 2582-30-1, 1-Aminoguanidine bicarbonate 2633-67-2, 4-Styrenesulfonyl chloride **2638-94-0**, 4,4'-**Azobis**(4-cyanovaleric acid) 2893-78-9, Dichloroisocyanuric acid, sodium salt 3804-23-7, Scandium acetate 4546-95-6, 1,2,3-Triazole-4,5-dicarboxylic acid 7447-41-8, **Lithium** chloride, reactions 7647-01-0, Hydrochloric acid, reactions 7647-14-5, Sodium chloride, reactions 7664-39-3, Hydrofluoric acid, reactions 7757-82-6, Sodium sulfate, reactions 7758-09-0, Potassium nitrite 7782-50-5, Chlorine, reactions 7789-23-3, Potassium fluoride 9002-92-0, Brij 30 13360-57-1 13637-84-8, Chlorosulfonyl fluoride 13781-67-4, 2-(3-Thienyl)ethanol 14635-75-7, Nitrosonium tetrafluoroborate 16090-14-5 17455-13-9, 18-Crown-6 17587-22-3, 1,1,1,2,2,3,3-Heptafluoro-7,7-dimethyl-4,6-octanedione 20583-66-8, 1,1,1,5,5,6,6,7,7,7-Decafluoro-2,4-Heptanedione 26628-22-8, Sodium azide 27070-49-1, 1,2,3-Triazole 31469-15-5, 1-Methoxy-1-(trimethylsilyloxy)-2-methyl-1-propene 39262-22-1 39377-49-6, Copper cyanide 53188-07-1, Trolox **56512-49-3**, 4-(Dimethylamino)**azobenzene**-4'-sulfonyl chloride 65039-09-0, 1-Ethyl-3-methyl-1H-imidazolium chloride 66051-48-7 77968-17-3 81850-46-6 81850-47-7 89183-45-9, Polyaniline hydrochloride 210049-00-6 210289-26-2 210289-55-7 210469-93-5 661461-58-1 661461-61-6
RL: RCT (Reactant); RACT (Reactant or reagent)
(**salts** of pentacyclic or tetrapentalene derived anions, and their uses as ionic conductive materials)

IT **126-33-0D**, Sulfolane, derivs.
RL: NUU (Other use, unclassified); USES (Uses)
(solvent for title compds.; salts of pentacyclic or tetrapentalene derived anions, and their uses as ionic conductive materials)

IT 156118-35-3DP, 2-(5-cyano-1,3,4-triazole)-4,4-difluorobutyl-, **lithium salt**

RL: PUR (Purification or recovery); SPN (Synthetic preparation); PREP (Preparation)
(surfactant and antistatic; salts of pentacyclic or tetrapentalene derived anions, and their uses as ionic conductive materials)

L54 ANSWER 7 OF 12 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 2004:119843 HCAPLUS Full-text
DOCUMENT NUMBER: 140:149224
TITLE: Nonaqueous **electrolytic** solution with improved safety for **lithium battery**
INVENTOR(S): Kim, Jun-ho; Lee, Ha-young; Choy, Sang-hoon; Kim, Ho-sung
PATENT ASSIGNEE(S): Samsung SDI Co., Ltd., S. Korea
SOURCE: U.S. Pat. Appl. Publ., 12 pp.
CODEN: USXXCO
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

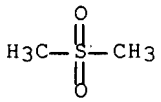
PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 2004029018	A1	20040212	US 2003-637554	20030811
US 7105250	B2	20060912		
KR 2004015420	A	20040219	KR 2002-47510	20020812
JP 2004079532	A	20040311	JP 2003-290946	20030808
CN 1495960	A	20040512	CN 2003-158672	20030812
PRIORITY APPLN. INFO.:			KR 2002-47510 A	20020812

AB A nonaq. **electrolytic** solution and a **lithium battery** employing the same include a **lithium salt**, an organic solvent, and a halogenated benzene compound The use of the nonaq. **electrolytic** solution causes formation of a polymer by oxidative decomposition of the **electrolytic** solution even if a sharp voltage increase occurs due to overcharging of the battery, leading to consumption of an overcharge current, thus protecting the battery.

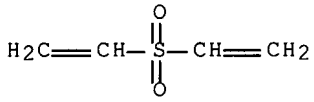
IT **67-71-0**, Methyl sulfone **77-77-0**, Vinyl sulfone **94-36-0**, **Benzoylperoxide**, uses **105-64-6**, Diisopropyl **peroxy** dicarbonate **105-74-8**, Lauroyl **peroxide** **126-33-0**, Tetramethylene sulfone **127-63-9**, Phenyl sulfone **620-32-6**, Benzyl sulfone **1561-49-5**, Dicyclohexyl **peroxy** dicarbonate **1712-87-4**, m-Toluoyl **peroxide** **3006-82-4**, tert-**Butylperoxy**-2-ethylhexanoate **14666-78-5** **15520-11-3**, Bis(4-tert-butylcyclohexyl) **peroxydicarbonate** **28452-93-9**, Butadiene sulfone **32752-09-3**, Isobutyl **peroxide** **92177-99-6**, 3,3,5-**Trimethylhexanoylperoxide**

RL: MOA (Modifier or additive use); USES (Uses)
(nonaq. **electrolytic** solution with improved safety for **lithium battery**)

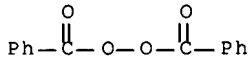
RN 67-71-0 HCAPLUS
CN Methane, 1,1'-sulfonylbis- (CA INDEX NAME)



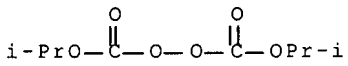
RN 77-77-0 HCAPLUS
CN Ethene, 1,1'-sulfonylbis- (CA INDEX NAME)



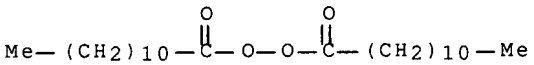
RN 94-36-0 HCAPLUS
CN Peroxide, dibenzoyl (CA INDEX NAME)



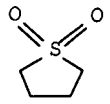
RN 105-64-6 HCAPLUS
CN Peroxydicarbonic acid, C,C'-bis(1-methylethyl) ester (CA INDEX NAME)



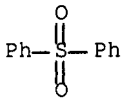
RN 105-74-8 HCAPLUS
CN Peroxide, bis(1-oxododecyl) (CA INDEX NAME)



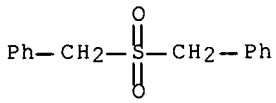
RN 126-33-0 HCAPLUS
CN Thiophene, tetrahydro-, 1,1-dioxide (CA INDEX NAME)



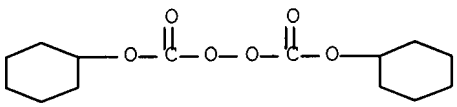
RN 127-63-9 HCAPLUS
CN Benzene, 1,1'-sulfonylbis- (CA INDEX NAME)



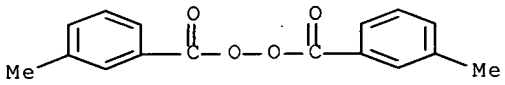
RN 620-32-6 HCAPLUS
CN Benzene, 1,1'-[sulfonylbis(methylene)]bis- (CA INDEX NAME)



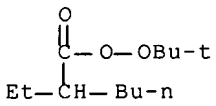
RN 1561-49-5 HCAPLUS
CN Peroxydicarbonic acid, C,C'-dicyclohexyl ester (CA INDEX NAME)



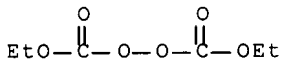
RN 1712-87-4 HCAPLUS
CN Peroxide, bis(3-methylbenzoyl) (CA INDEX NAME)



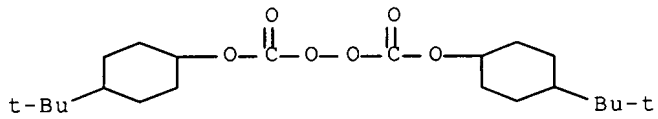
RN 3006-82-4 HCAPLUS
CN Hexaneperoxoic acid, 2-ethyl-, 1,1-dimethylethyl ester (CA INDEX NAME)



RN 14666-78-5 HCAPLUS
CN Peroxydicarbonic acid, diethyl ester (CA INDEX NAME)



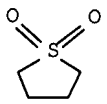
RN 15520-11-3 HCAPLUS
CN Peroxydicarbonic acid, C,C'-bis[4-(1,1-dimethylethyl)cyclohexyl] ester (CA INDEX NAME)



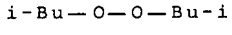
RN 28452-93-9 HCAPLUS
CN Thiophene, dihydro-, 1,1-dioxide (CA INDEX NAME)

CM 1

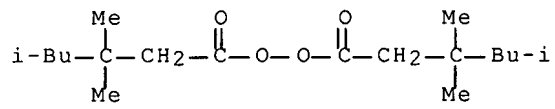
CRN 126-33-0
CMF C4 H8 O2 S



RN 32752-09-3 HCAPLUS
CN Peroxide, bis(2-methylpropyl) (CA INDEX NAME)



RN 92177-99-6 HCAPLUS
CN Peroxide, bis(3,3,5-trimethyl-1-oxohexyl) (9CI) (CA INDEX NAME)



IC ICM H01M010-40
INCL 429326000; 429200000; 429340000; 429331000; 429332000
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
ST **lithium battery** nonaq **electrolyte** soln
improved safety
IT Esters, uses
Ethers, uses
Hydrocarbons, uses
RL: MOA (Modifier or additive use); USES (Uses)
(C1-20; nonaq. **electrolytic** solution with improved safety for **lithium battery**)
IT Aromatic hydrocarbons, uses
RL: MOA (Modifier or additive use); USES (Uses)
(C5-20; nonaq. **electrolytic** solution with improved safety for **lithium battery**)
IT Secondary **batteries**
(**lithium**; nonaq. **electrolytic** solution with improved safety for **lithium battery**)
IT Battery **electrolytes**
(nonaq. **electrolytic** solution with improved safety for **lithium battery**)
IT Polyesters, uses
RL: MOA (Modifier or additive use); USES (Uses)
(nonaq. **electrolytic** solution with improved safety for **lithium battery**)
IT Alcohols, uses
RL: MOA (Modifier or additive use); USES (Uses)
(polyhydric; nonaq. **electrolytic** solution with improved safety for **lithium battery**)
IT 3087-37-4, Tetrapropyltitanate
RL: CAT (Catalyst use); USES (Uses)
(nonaq. **electrolytic** solution with improved safety for **lithium battery**)
IT 502-44-3, ε-Caprolactone 7439-93-2D, **Lithium**, **salt** 12190-79-3, Cobalt lithium oxide colio2
RL: DEV (Device component use); USES (Uses)
(nonaq. **electrolytic** solution with improved safety for **lithium battery**)
IT 126-58-9DP, Dipentaerythritol, derivative
RL: DEV (Device component use); SPN (Synthetic preparation); PREP (Preparation); USES (Uses)
(nonaq. **electrolytic** solution with improved safety for **lithium battery**)
IT 56-81-5, Glycerol, uses **67-71-0**, Methyl sulfone
71-43-2D, Benzene, halogenated **77-77-0**, Vinyl sulfone
94-36-0, **Benzoylperoxide**, uses 96-49-1, Ethylene carbonate **105-64-6**, Diisopropyl **peroxy** dicarbonate **105-74-8**, Lauroyl **peroxide**
108-32-7, Propylene carbonate 115-77-5, Pentaerythritol, uses **126-33-0**, Tetramethylene sulfone 126-58-9, DiPentaerythritol **127-63-9**, Phenyl sulfone 456-55-3, Trifluoromethyl phenyl ether 462-06-6, Fluorobenzene

620-32-6, Benzyl sulfone 623-53-0, Ethyl methyl carbonate **1561-49-5**, Dicyclohexyl **peroxy** dicarbonate **1712-87-4**, m-Toluoyl **peroxide** 2972-19-2 **3006-82-4**, tert-**Butylperoxy**-2-ethylhexanoate 9002-88-4, Polyethylene 9003-07-0, Polypropylene **14666-78-5 15520-11-3**, Bis(4-tert-butylcyclohexyl) **peroxydicarbonate** 21151-56-4, Benzene, 1-chloro-4-(chloromethoxy)- 21324-40-3, Lithium hexafluorophosphate **28452-93-9**, Butadiene sulfone **32752-09-3**, Isobutyl **peroxide 92177-99-6** , 3,3,5-**Trimethylhexanoylperoxide** 130038-50-5, 2-Propenoic acid, 2-methyl-, ion(1-) homopolymer, uses 651294-25-6 651294-26-7 651294-27-8
RL: MOA (Modifier or additive use); USES (Uses)
(nonaq. **electrolytic** solution with improved safety for **lithium battery**)

REFERENCE COUNT: 6 THERE ARE 6 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L54 ANSWER 8 OF 12 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 2003:796195 HCAPLUS Full-text
DOCUMENT NUMBER: 139:294681
TITLE: **Electrolyte** for **lithium** **battery** to reduce overcharge and improve electrochemical characteristics
INVENTOR(S): Kim, Jun-Ho; Lee, Ha-Young; Choy, Sang-Hoon; Kim, Ho-Sung; Noh, Hyeong-Gon
PATENT ASSIGNEE(S): Samsung SDI Co., Ltd., S. Korea
SOURCE: U.S. Pat. Appl. Publ., 19 pp.
CODEN: USXXCO
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 2003190529	A1	20031009	US 2003-393294	200303 21
US 7205073	B2	20070417		
KR 2003079310	A	20031010	KR 2002-18264	200204 03
CN 1449070	A	20031015	CN 2003-108529	200303 28
JP 2003297426	A	20031017	JP 2003-100349	200304 03
US 2007212614	A1	20070913	US 2007-714197	200703 06

PRIORITY APPLN. INFO.: KR 2002-18264 A 200204 03
US 2003-393294 A3

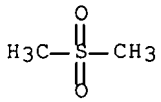
200303
21

OTHER SOURCE(S): MARPAT 139:294681

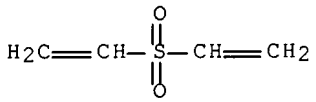
AB An **electrolyte** for a **lithium battery** includes a nonaq. organic solvent, a **lithium salt**, and an additive comprising (a) a compound represented by the formula [(R1)nC6H(6-n+m)(X)m], and (b) a compound selected from the group consisting of a sulfone-based compound, a poly(ester)(meth)acrylate, a polymer of poly(ester)(meth)acrylate, and a mixture thereof: wherein R1 is a C1-10 alkyl, a C 1-10 alkoxy, or a C6-10 aryl, and preferably a Me, Et, or methoxy, X is a halogen, and m and n are integers ranging from 1 to 5, where m+n is less than or equal to 6.

IT **67-71-0**, Methyl sulfone **77-77-0**, Vinyl sulfone **94-36-0**, Benzoyl **peroxide**, uses **105-64-6**, Diisopropyl **peroxy** dicarbonate **105-74-8**, Lauroyl **peroxide** **126-33-0**, Tetramethylene sulfone **127-63-9**, Phenyl sulfone **620-32-6**, Benzyl sulfone **1561-49-5**, Dicyclohexyl **peroxy** dicarbonate **1712-87-4**, m-Toluoyl **peroxide** **3006-82-4**, tert-**Butylperoxy**-2-ethyl-hexanoate **14666-78-5** **15520-11-3**, Bis(4-tert-butylcyclohexyl) **peroxy** dicarbonate **28452-93-9**, Butadiene sulfone **32752-09-3**, Isobutyl **peroxide** **92177-99-6**, 3,3,5-Trimethylhexanoyl **peroxide**
RL: MOA (Modifier or additive use); USES (Uses)
(**electrolyte** for **lithium battery** to reduce overcharge and improve electrochem. characteristics)

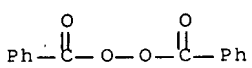
RN 67-71-0 HCAPLUS
CN Methane, 1,1'-sulfonylbis- (CA INDEX NAME)



RN 77-77-0 HCAPLUS
CN Ethene, 1,1'-sulfonylbis- (CA INDEX NAME)

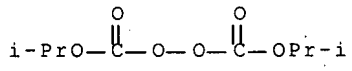


RN 94-36-0 HCAPLUS
CN Peroxide, dibenzoyl (CA INDEX NAME)

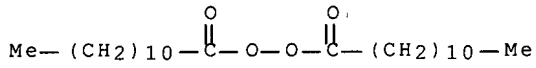


RN 105-64-6 HCAPLUS

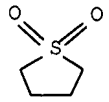
CN Peroxydicarbonic acid, C,C'-bis(1-methylethyl) ester (CA INDEX NAME)



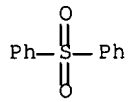
RN 105-74-8 HCAPLUS
CN Peroxide, bis(1-oxododecyl) (CA INDEX NAME)



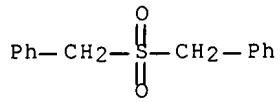
RN 126-33-0 HCAPLUS
CN Thiophene, tetrahydro-, 1,1-dioxide (CA INDEX NAME)



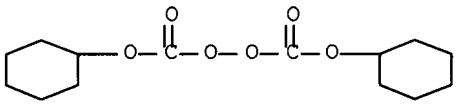
RN 127-63-9 HCAPLUS
CN Benzene, 1,1'-sulfonylbis- (CA INDEX NAME)



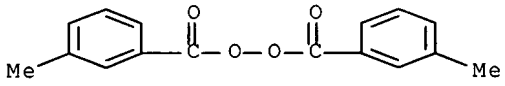
RN 620-32-6 HCAPLUS
CN Benzene, 1,1'-[sulfonylbis(methylene)]bis- (CA INDEX NAME)



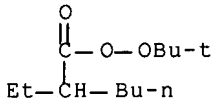
RN 1561-49-5 HCAPLUS
CN Peroxydicarbonic acid, C,C'-dicyclohexyl ester (CA INDEX NAME)



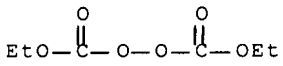
RN 1712-87-4 HCAPLUS
CN Peroxide, bis(3-methylbenzoyl) (CA INDEX NAME)



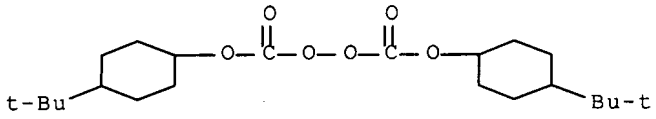
RN 3006-82-4 HCAPLUS
CN Hexaneperoxoic acid, 2-ethyl-, 1,1-dimethylethyl ester (CA INDEX NAME)



RN 14666-78-5 HCAPLUS
CN Peroxydicarbonic acid, diethyl ester (CA INDEX NAME)



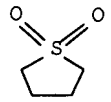
RN 15520-11-3 HCAPLUS
CN Peroxydicarbonic acid, C,C'-bis[4-(1,1-dimethylethyl)cyclohexyl] ester (CA INDEX NAME)



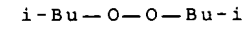
RN 28452-93-9 HCAPLUS
CN Thiophene, dihydro-, 1,1-dioxide (CA INDEX NAME)

CM 1

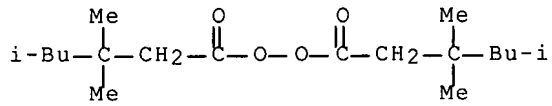
CRN 126-33-0
CMF C4 H8 O2 S



RN 32752-09-3 HCAPLUS
CN Peroxide, bis(2-methylpropyl) (CA INDEX NAME)



RN 92177-99-6 HCAPLUS
CN Peroxide, bis(3,3,5-trimethyl-1-oxohexyl) (9CI) (CA INDEX NAME)



IC ICM H01M006-18
INCL 429307000; 429309000; 429326000; 429322000; 429323000; 429330000
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
ST **lithium battery electrolyte** overcharge lowering
IT **Battery electrolytes**
(**electrolyte** for **lithium battery** to reduce overcharge and improve electrochem. characteristics)
IT Secondary **batteries**
(**lithium**; **electrolyte** for **lithium battery** to reduce overcharge and improve electrochem. characteristics)
IT **Peroxides**, uses
RL: MOA (Modifier or additive use); USES (Uses)
(organic; **electrolyte** for **lithium battery** to reduce overcharge and improve electrochem. characteristics)
IT Alcohols, uses
RL: MOA (Modifier or additive use); USES (Uses)
(trihydric; **electrolyte** for **lithium battery** to reduce overcharge and improve electrochem. characteristics)
IT 3087-37-4, Tetrapropyltitanate
RL: CAT (Catalyst use); USES (Uses)
(**electrolyte** for **lithium battery** to reduce overcharge and improve electrochem. characteristics)
IT 71-43-2, Benzene, uses 96-49-1, Ethylene carbonate 105-58-8, Diethyl carbonate 108-32-7, Propylene carbonate 108-88-3, Toluene, uses 462-06-6, Fluorobenzene 616-38-6, Dimethyl carbonate 623-53-0, Ethyl methyl carbonate 623-96-1, Dipropyl carbonate 1330-20-7, Xylene, uses 4437-85-8, Butylene carbonate 7447-41-8, Lithium chloride (LiCl), uses 7791-03-9, Lithium perchlorate 10377-51-2, Lithium iodide (LiI) 12355-58-7, Lithium aluminate (Li5AlO4) 14283-07-9, Lithium tetrafluoroborate

18424-17-4, Lithium hexafluoroantimonate 21324-40-3, Lithium hexafluorophosphate 27359-10-0, Trifluorotoluene 29935-35-1, Lithium hexafluoroarsenate 33454-82-9, Lithium triflate 35363-40-7, Ethyl propyl carbonate, uses 56525-42-9, Methyl propyl carbonate, uses 90076-65-6 131651-65-5, Lithium perfluorobutanesulfonate
RL: DEV (Device component use); USES (Uses)
(**electrolyte** for **lithium battery** to reduce overcharge and improve electrochem. characteristics)

IT 126-58-9DP, Dipentaerythritol, reaction product with ε-caprolactone 502-44-3DP, ε-Caprolactone, reaction product with dipentaerythritol 609772-45-4P
RL: DEV (Device component use); SPN (Synthetic preparation); PREP (Preparation); USES (Uses)
(**electrolyte** for **lithium battery** to reduce overcharge and improve electrochem. characteristics)

IT 56-81-5, Glycerol, uses **67-71-0**, Methyl sulfone **77-77-0**, Vinyl sulfone 79-10-7D, Acrylic acid, ω-fatty acid esters C2-C21 79-41-4D, Methacrylic acid, ω-fatty acid esters C2-C21 **94-36-0**, Benzoyl **peroxide**, uses 104-92-7, 4-Bromoanisole **105-64-6**, Diisopropyl **peroxy** dicarbonate **105-74-8**, Lauroyl **peroxide** **126-33-0**, Tetramethylene sulfone **127-63-9**, Phenyl sulfone 149-32-6, Erythritol 452-10-8, 2,4-Difluoroanisole 456-49-5, 3-Fluoroanisole 459-60-9, 4-Fluoroanisole **620-32-6**, Benzyl sulfone 623-12-1, 4-Chloroanisole **1561-49-5**, Dicyclohexyl **peroxy** dicarbonate **1712-87-4**, m-Toluoyl **peroxide** 2398-37-0, 3-Bromoanisole 2845-89-8, 3-Chloroanisole **3006-82-4**, tert-**Butylperoxy**-2-ethyl-hexanoate **14666-78-5** **15520-11-3**, Bis(4-tert-butylcyclohexyl)**peroxy** dicarbonate **28452-93-9**, Butadiene sulfone **32752-09-3**, Isobutyl **peroxide** **92177-99-6**, 3,3,5-Trimethylhexanoyl **peroxide** 93343-10-3, 3,5-Difluoroanisole 202925-08-4, 3-Chloro-5-fluoroanisole 609365-67-5
RL: MOA (Modifier or additive use); USES (Uses)
(**electrolyte** for **lithium battery** to reduce overcharge and improve electrochem. characteristics)

L54 ANSWER 9 OF 12 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 2003:727549 HCAPLUS Full-text
DOCUMENT NUMBER: 139:397889
TITLE: Oxygen Transport Properties of Organic **Electrolytes** and Performance of **Lithium**/Oxygen **Battery**
AUTHOR(S): Read, J.; Mutolo, K.; Ervin, M.; Behl, W.; Wolfenstine, J.; Driedger, A.; Foster, D.
CORPORATE SOURCE: US Army Research Laboratory, AMSRL-SE-DC, Adelphi, MD, 20783-1197, USA
SOURCE: Journal of the Electrochemical Society (2003), 150(10), A1351-A1356
CODEN: JESOAN; ISSN: 0013-4651
PUBLISHER: Electrochemical Society
DOCUMENT TYPE: Journal
LANGUAGE: English

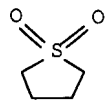
AB The oxygen transport properties of several organic **electrolytes** were characterized through measurements of oxygen solubility and **electrolyte** viscosity. Oxygen diffusion coeffs. were calculated from **electrolyte**

viscosities using the Stokes-Einstein relation. Oxygen solubility, **electrolyte** viscosity, and oxygen partial pressure were all directly correlated to discharge capacity and rate capability. Substantial improvement in cell performance was achieved through **electrolyte** optimization and increased oxygen partial pressure. The concentration of oxygen in the electrode under discharge was calculated using a semi-infinite medium model with simultaneous diffusion and reaction. The model was used to explain the dependence of cell performance on oxygen transport in organic **electrolyte**.

IT **126-33-0**, Tetramethylene sulfone
RL: DEV (Device component use); PRP (Properties); RCT (Reactant); RACT (Reactant or reagent); USES (Uses)
(**electrolyte** solvent; oxygen transport properties of organic **electrolytes** and performance of **lithium**/oxygen **battery**)

RN 126-33-0 HCAPLUS

CN Thiophene, tetrahydro-, 1,1-dioxide (CA INDEX NAME)



CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 45, 72, 76

ST oxygen diffusion **lithium battery** **electrolyte** soly viscosity oxide capacity

IT Solubility
(Bunsen coeffs. of oxygen in solvents and **lithium salt**/solvent **electrolyte** mixts.; oxygen transport properties of organic **electrolytes** and performance of **lithium**/oxygen **battery**)

IT Fluoropolymers, uses
RL: DEV (Device component use); TEM (Technical or engineered material use); USES (Uses)
(composite cathode with Super P; oxygen transport properties of organic **electrolytes** and performance of **lithium**/oxygen **battery**)

IT Primary **batteries**
(**lithium**; oxygen transport properties of organic **electrolytes** and performance of **lithium**/oxygen **battery**)

IT Electric impedance
(of batteries with various **electrolyte** solns.; oxygen transport properties of organic **electrolytes** and performance of **lithium**/oxygen **battery**)

IT Ionic conductivity
Viscosity
(of **lithium salt**/solvent **electrolyte** mixts.; oxygen transport properties of organic **electrolytes** and performance of **lithium**/oxygen **battery**)

IT Absorption
(of oxygen by **electrolyte** solns.; oxygen transport properties of organic **electrolytes** and performance of **lithium**/oxygen **battery**)

IT Battery **electrolytes**
(oxygen transport properties of organic **electrolytes** and performance of **lithium**/oxygen **battery**)

IT Diffusion

(oxygen; oxygen transport properties of organic **electrolytes** and performance of **lithium**/oxygen **battery**)

IT Electric energy
(specific discharge capacity; oxygen transport properties of organic **electrolytes** and performance of **lithium**/oxygen **battery**)

IT 7440-44-0, Super P, uses
RL: DEV (Device component use); TEM (Technical or engineered material use); USES (Uses)
(activated, composite cathode with PTFE; oxygen transport properties of organic **electrolytes** and performance of **lithium**/oxygen **battery**)

IT 7429-90-5, Aluminum, uses
RL: DEV (Device component use); TEM (Technical or engineered material use); USES (Uses)
(cathode support and current collectors; oxygen transport properties of organic **electrolytes** and performance of **lithium**/oxygen **battery**)

IT 9002-84-0, PTFE
RL: DEV (Device component use); TEM (Technical or engineered material use); USES (Uses)
(composite cathode with Super P; oxygen transport properties of organic **electrolytes** and performance of **lithium**/oxygen **battery**)

IT 7782-44-7, Oxygen, uses
RL: PRP (Properties); RCT (Reactant); TEM (Technical or engineered material use); RACT (Reactant or reagent); USES (Uses)
(diffusion; oxygen transport properties of organic **electrolytes** and performance of **lithium**/oxygen **battery**)

IT 21324-40-3, Lithium hexafluorophosphate (LiPF6)
RL: DEV (Device component use); PRP (Properties); RCT (Reactant); RACT (Reactant or reagent); USES (Uses)
(**electrolyte** solute; oxygen transport properties of organic **electrolytes** and performance of **lithium**/oxygen **battery**)

IT 67-68-5, Dimethyl sulfoxide, uses 96-48-0, γ-Butyrolactone 96-49-1, Ethylene carbonate 105-58-8, Diethyl carbonate 108-32-7, Propylene carbonate 109-99-9, Tetrahydrofuran, uses 110-71-4, 1,2-Dimethoxyethane 112-49-2, Triethylene glycol dimethyl ether **126-33-0**, Tetramethylene sulfone 143-24-8, Tetraethylene glycol dimethyl ether 616-38-6, Dimethyl carbonate 623-53-0, Ethyl methyl carbonate 623-96-1, Dipropyl carbonate 872-50-4, uses
RL: DEV (Device component use); PRP (Properties); RCT (Reactant); RACT (Reactant or reagent); USES (Uses)
(**electrolyte** solvent; oxygen transport properties of organic **electrolytes** and performance of **lithium**/oxygen **battery**)

IT 12031-80-0, Lithium **peroxide** (Li2O2) 12057-24-8, Lithium oxide (Li2O), formation (nonpreparative)
RL: FMU (Formation, unclassified); FORM (Formation, nonpreparative)
(film formed on cathode to kill discharge; oxygen transport properties of organic **electrolytes** and performance of **lithium**/oxygen **battery**)

IT 7439-93-2, Lithium, uses
RL: DEV (Device component use); USES (Uses)
(oxygen transport properties of organic **electrolytes** and performance of **lithium**/oxygen **battery**)

IT 7440-02-0, Nickel, uses

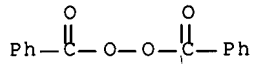
RL: DEV (Device component use); TEM (Technical or engineered material use); USES (Uses)
(oxygen transport properties of organic **electrolytes** and performance of **lithium**/oxygen **battery**)
REFERENCE COUNT: 14 THERE ARE 14 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L54 ANSWER 10 OF 12 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 2003:656287 HCAPLUS Full-text
DOCUMENT NUMBER: 139:182872
TITLE: Polymer **electrolyte** for **lithium** secondary **battery**
INVENTOR(S): Jung, Cheol-Soo; Kim, Ki-Ho; Bong, Cul-Hwen; Yang, Doo-Kyung; Lee, Kyoung-Hee; Lee, Yong-Beom; Lim, Hyun-Leong; Yamaguchi, Takitaro; Shimizu, Ryuichi
PATENT ASSIGNEE(S): Samsung SDI Co., Ltd., S. Korea
SOURCE: U.S. Pat. Appl. Publ., 14 pp.
CODEN: USXXCO
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

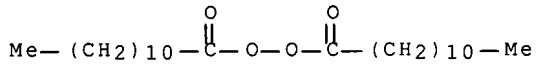
PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 2003157411	A1	20030821	US 2002-287486	20021105
US 7223501	B2	20070529		
KR 2003068714	A	20030825	KR 2002-8303	20020216
JP 2003249264	A	20030905	JP 2003-31544	20030207
CN 1438727	A	20030827	CN 2003-103890	20030214
PRIORITY APPLN. INFO.:			KR 2002-8303 A	20020216

AB A solid polymer **electrolyte**, a **lithium battery** employing the same, and methods of forming the **electrolyte** and the **lithium battery** are disclosed. The polymer **electrolyte** includes polyester methacrylate having a polyester polyol moiety having three or more hydroxide (-OH) groups, at least one hydroxde group being substituted by a methacrylic ester group and at least one hydroxide group being substituted by a radical non-reactive group, or its polymer, a **peroxide** having 6-40 carbon atoms, and an **electrolytic** solution including a **lithium salt** and an organic solvent.
IT **94-36-0**, Benzoyl **peroxide**, processes
105-74-8, Lauroyl **peroxide**
RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); PROC (Process)
(polymer **electrolyte** for **lithium** secondary **battery**)
RN 94-36-0 HCAPLUS

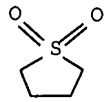
CN Peroxide, dibenzoyl (CA INDEX NAME)



RN 105-74-8 HCAPLUS
CN Peroxide, bis(1-oxododecyl) (CA INDEX NAME)



IT **126-33-0**, Sulfolane
RL: DEV (Device component use); USES (Uses)
(polymer **electrolyte** for **lithium** secondary **battery**)
RN 126-33-0 HCAPLUS
CN Thiophene, tetrahydro-, 1,1-dioxide (CA INDEX NAME)



IC ICM H01M010-40
ICS H01M010-04
INCL 429317000; 429307000; 429316000; 029623100
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 38
ST polymer **electrolyte lithium** secondary **battery**
IT Aromatic hydrocarbons, uses
RL: MOA (Modifier or additive use); USES (Uses)
(fluoro; polymer **electrolyte** for **lithium** secondary **battery**)
IT Secondary **batteries**
(**lithium**; polymer **electrolyte** for **lithium** secondary **battery**)
IT Battery **electrolytes**
Polymer **electrolytes**
(polymer **electrolyte** for **lithium** secondary **battery**)
IT Polyesters, uses
RL: DEV (Device component use); USES (Uses)
(polymer **electrolyte** for **lithium** secondary **battery**)
IT 3087-37-4, Tetrapropyltitanate
RL: CAT (Catalyst use); USES (Uses)
(polymer **electrolyte** for **lithium** secondary **battery**)
IT **94-36-0**, Benzoyl **peroxide**, processes
105-74-8, Lauroyl **peroxide**

RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); PROC (Process)
(polymer **electrolyte** for **lithium** secondary **battery**)

IT 67-68-5, Dmso, uses 68-12-2, Dmf, uses 75-05-8, Acetonitrile, uses 96-47-9, 2-Methyltetrahydrofuran 96-48-0, γ-Butyrolactone 96-49-1, Ethylene carbonate 98-95-3, Nitrobenzene, uses 100-47-0, Benzonitrile, uses 105-58-8, Diethyl carbonate 108-32-7, Propylene carbonate 108-90-7, Chlorobenzene, uses 109-99-9, Thf, uses 110-71-4, 1,2-Dimethoxyethane 111-46-6, Diethylene glycol, uses 115-10-6, Dimethyl ether **126-33-0**, Sulfolane 127-19-5, Dimethylacetamide 542-52-9, Dibutyl carbonate 616-38-6, Dimethyl carbonate 623-53-0, Ethyl methyl carbonate 623-96-1, Dipropyl carbonate 646-06-0, Dioxolane 872-36-6, Vinylene carbonate 1072-47-5, 1,3-Dioxolane, 4-methyl 1300-21-6, Dichloroethane 4437-85-8, Butylene carbonate 6482-34-4, Diisopropyl carbonate 7447-41-8, Lithium chloride (LiCl), uses 7791-03-9, Lithium perchlorate 9002-88-4, Polyethylene 9003-07-0, Polypropylene 10377-51-2, Lithium iodide (LiI) 14024-11-4, Aluminum lithium chloride alicl4 14283-07-9, Lithium tetrafluoroborate 18424-17-4, Lithium hexafluoroantimonate 21324-40-3, Lithium hexafluorophosphate 29935-35-1, Lithium hexafluoroarsenate 30714-78-4, Ethyl butyl carbonate 33454-82-9, Lithium triflate 51729-83-0, Methyl isopropyl carbonate 56525-42-9, Methyl propyl carbonate, uses 90076-65-6 131651-65-5
RL: DEV (Device component use); USES (Uses)
(polymer **electrolyte** for **lithium** secondary **battery**)

IT 95-52-3, 2-Fluorotoluene 352-32-9, 4-Fluorotoluene 352-70-5, 3-Fluorotoluene 462-06-6, Benzene, fluoro- 581054-59-3D, mixed acrylic and pentanoic acid esters
RL: MOA (Modifier or additive use); USES (Uses)
(polymer **electrolyte** for **lithium** secondary **battery**)

REFERENCE COUNT: 2 THERE ARE 2 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L54 ANSWER 11 OF 12 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 1999:375786 HCAPLUS Full-text
DOCUMENT NUMBER: 131:7556
TITLE: Fire-resistant gas generating battery **electrolytes**
INVENTOR(S): Narang, Subhash; Ventura, Susanna; Cox, Philip
PATENT ASSIGNEE(S): SRI International, USA
SOURCE: PCT Int. Appl., 36 pp.
CODEN: PIXXD2
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

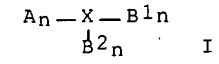
PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 9928987	A1	19990610	WO 1998-US25466	19981201

W: AL, AM, AT, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU,

CZ, CZ, DE, DE, DK, DK, EE, EE, ES, FI, FI, GB, GE, GH, GM,
HR, HU, ID, IL, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS,
LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU,
SD, SE, SG, SI, SK, SK, SL, TJ, TM, TR, TT, UA, UG, US, UZ,
VN, YU, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM
RW: GH, GM, KE, LS, MW, SD, SZ, UG, ZW, AT, BE, CH, CY, DE, DK,
ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, BF, BJ, CF,
CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG

CA 2313027	A1	19990610	CA 1998-2313027	199812 01
AU 9916161	A	19990616	AU 1999-16161	199812 01
EP 1042838	A1	20001011	EP 1998-960601	199812 01
R: DE, GB				
JP 2001525597	T	20011211	JP 2000-523720	199812 01
PRIORITY APPLN. INFO.:			US 1997-67226P P	199712 02
			WO 1998-US25466 W	199812 01

GI



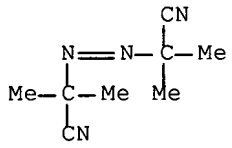
I

AB A compound that generates a fire-retardant gas upon decomposition has general structure (I) wherein, X is N, C, S, NO, N2, CO, SO; A is substantially any organic moiety including alkyl, aryl, alkoxy, cyclic, fused cyclic, heteroatoms, ketals, acetals or alcs. B1 and B2 are substantially any organic moiety including alkyl, aryl, alkoxy, cyclic, fused cyclic, heteroatoms, ketals, acetals or alcs., also including oxygen, hydrogen and null; and n is an integer from 0-100. Preferred gases generated thereby include CO, SO2, SO3, NO, N2O, NO2 and N2. It is also preferred that the generated gas assists in formation of a solid **electrolyte** interface (SEI) between the **electrolyte** and at least one of the electrodes. It is most preferred that the cell have a conductivity greater than 10-3 S/cm.

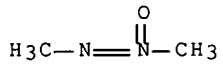
IT **78-67-1, Azobis**(isobutyronitrile)
25843-45-2, Azoxymethane 28452-93-9,
Butadiene sulfone
RL: MOA (Modifier or additive use); USES (Uses)
(**electrolyte** additive; fire-resistant gas generating battery **electrolytes**)

RN 78-67-1 HCAPLUS

CN Propanenitrile, 2,2'-(1,2-diazenediyl)bis[2-methyl- (CA INDEX NAME)



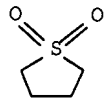
RN 25843-45-2 HCAPLUS
CN Diazene, dimethyl-, 1-oxide (9CI) (CA INDEX NAME)



RN 28452-93-9 HCAPLUS
CN Thiophene, dihydro-, 1,1-dioxide (CA INDEX NAME)

CM 1

CRN 126-33-0
CMF C4 H8 O2 S



IC ICM H01M010-40
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
ST battery **electrolyte** fire resistant gas generation
IT **Azo** compounds
Azoxy compounds
Nitrites
Sulfates, uses
Sulfites
Sulfones
RL: MOA (Modifier or additive use); USES (Uses)
(**electrolyte** additive; fire-resistant gas generating battery **electrolytes**)
IT Battery **electrolytes**
Fire-resistant materials
(fire-resistant gas generating battery **electrolytes**)
IT Fluoropolymers, uses
RL: MOA (Modifier or additive use); USES (Uses)
(fire-resistant gas generating battery **electrolytes**)
IT Secondary **batteries**
(**lithium**; fire-resistant gas generating battery **electrolytes**)
IT **78-67-1**, **Azobis**(isobutyronitrile) 78-82-0, Isopropyl nitrile 543-29-3, Isobutyl nitrate 822-38-8, Ethylene trithiocarbonate 3741-38-6, Ethylene sulfite **25843-45-2**, **Azoxymethane** 28322-92-1 **28452-93-9**, Butadiene sulfone
RL: MOA (Modifier or additive use); USES (Uses)

(**electrolyte** additive; fire-resistant gas generating battery **electrolytes**)

IT 7439-93-2, Lithium, uses 7782-42-5, Graphite, uses 12057-17-9, Lithium manganese oxide limn2o4 12068-85-8, Iron disulfide 52627-24-4, Cobalt lithium oxide
RL: DEV (Device component use); USES (Uses)
(fire-resistant gas generating battery **electrolytes**)

IT 96-49-1, Ethylene carbonate 616-38-6, Dimethyl carbonate 21324-40-3, Lithium hexafluorophosphate
RL: DEV (Device component use); TEM (Technical or engineered material use); USES (Uses)
(fire-resistant gas generating battery **electrolytes**)

IT 630-08-0, Carbon monoxide, formation (nonpreparative) 7446-09-5, Sulfur dioxide, formation (nonpreparative) 7446-11-9, Sulfur trioxide, formation (nonpreparative) 7727-37-9, Nitrogen, formation (nonpreparative) 10024-97-2, Nitrogen oxide (N2O), formation (nonpreparative) 10102-43-9, Nitric oxide, formation (nonpreparative) 10102-44-0, Nitrogen dioxide, formation (nonpreparative)
RL: FMU (Formation, unclassified); FORM (Formation, nonpreparative)
(fire-resistant gas generating battery **electrolytes**)

IT 78-40-0, Triethyl phosphate 24937-79-9
RL: MOA (Modifier or additive use); USES (Uses)
(fire-resistant gas generating battery **electrolytes**)

REFERENCE COUNT: 6 THERE ARE 6 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L54 ANSWER 12 OF 12 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 1997:702055 HCAPLUS Full-text
DOCUMENT NUMBER: 128:13756
TITLE: Acrylic polyurethane solid **electrolyte** -formable compositions and manufacture of solid **electrolytes** using them
INVENTOR(S): Takiyama, Eiichiro; Matsui, Fumio; Morita, Katsuhisa; Takino, Yukiko; Ogiwara, Kazushige; Takahashi, Kentaro
PATENT ASSIGNEE(S): Showa Highpolymer Co., Ltd., Japan
SOURCE: Jpn. Kokai Tokkyo Koho, 8 pp.
CODEN: JKXXAF
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 09278971	A	19971028	JP 1996-88528	19960410

PRIORITY APPLN. INFO.: JP 1996-88528 19960410

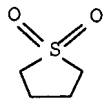
AB The compns. contain (A) monomers having (meth)acryloyl groups and acetoacetoxy groups in a mol., (B) unsatd. polyurethanes obtained by reaction of (meth)acryloyl- and OH-having unsatd. polyesters with isocyanates, (C) Li compds., and (D) solvents which can dissolve the Li compds. The **electrolytes** are manufactured by polymerization of the above compns., which may be

previously partially polymerized to control the viscosity, in a die. The compns. are useful for manufacture of film batteries. Thus, a composition containing AAEM (acetoacetoxyethyl methacrylate) 100, an unsatd. polyurethane [obtained by reaction of Placcel FM 5 with MOI (isocyanatoethyl methacrylate)] 15, propylene carbonate 185, LiBF4 30, and benzoyl **peroxide** 2 parts was casted between 2 Pt electrode plate and polymerized at 80-100° for 2 h under N flow to give a soft gelatin-like polymer film with elec. conductivity 2.1 + 10-4 S/cm.

IT **126-33-0**, Sulfolane
RL: NUU (Other use, unclassified); USES (Uses)
(solvent; manufacture of solid **electrolytes** from acrylic polyurethanes compns. containing acetoacetoxyethyl (meth)acrylate, unsatd. polyurethanes, and Li compds.)

RN 126-33-0 HCAPLUS

CN Thiophene, tetrahydro-, 1,1-dioxide (CA INDEX NAME)



IC ICM C08L033-14
ICS C08K003-24; C08L075-14; H01B001-06; H01M006-18; H01M010-40

CC 37-6 (Plastics Manufacture and Processing)
Section cross-reference(s): 52

ST acrylic polyurethane solid **electrolyte lithium salt**; cast polymn acrylic polyurethane solid **electrolyte**; acetoacetoxyethyl acrylate polyurethane **lithium salt electrolyte**; methacrylate acetoacetoxyethyl polyurethane **lithium salt electrolyte**

IT Polyurethanes, preparation
RL: IMF (Industrial manufacture); POF (Polymer in formulation); PRP (Properties); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(acrylic; manufacture of solid **electrolytes** from acrylic polyurethanes compns. containing acetoacetoxyethyl (meth)acrylate, unsatd. polyurethanes, and Li compds.)

IT Polymerization
(casting; manufacture of solid **electrolytes** from acrylic polyurethanes compns. containing acetoacetoxyethyl (meth)acrylate, unsatd. polyurethanes, and Li compds.)

IT Battery **electrolytes**
(manufacture of solid **electrolytes** from acrylic polyurethanes compns. containing acetoacetoxyethyl (meth)acrylate, unsatd. polyurethanes, and Li compds.)

IT Polyurethanes, preparation
RL: IMF (Industrial manufacture); POF (Polymer in formulation); PRP (Properties); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(polyoxyalkylene-, acrylic; manufacture of solid **electrolytes** from acrylic polyurethanes compns. containing acetoacetoxyethyl (meth)acrylate, unsatd. polyurethanes, and Li compds.)

IT Polyelectrolytes
(solid; manufacture of solid **electrolytes** from acrylic polyurethanes compns. containing acetoacetoxyethyl (meth)acrylate, unsatd. polyurethanes, and Li compds.)

IT 198956-70-6P 198956-71-7P

RL: IMF (Industrial manufacture); POF (Polymer in formulation); PRP (Properties); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(manufacture of solid **electrolytes** from acrylic polyurethanes compns. containing acetoacetoxyethyl (meth)acrylate, unsatd. polyurethanes, and Li compds.)

IT 7791-03-9, Lithium perchlorate 14024-11-4, Lithium tetrachloroaluminate 14283-07-9, Lithium tetrafluoroborate 21324-40-3, Lithium hexafluorophosphate 33454-82-9, Lithium trifluoromethanesulfonate
RL: PRP (Properties); TEM (Technical or engineered material use); USES (Uses)
(manufacture of solid **electrolytes** from acrylic polyurethanes compns. containing acetoacetoxyethyl (meth)acrylate, unsatd. polyurethanes, and Li compds.)

IT 75-05-8, Acetonitrile, uses 96-48-0, γ-Butyrolactone 108-32-7, Propylene carbonate 110-71-4, 1,2-Dimethoxyethane **126-33-0**, Sulfolane
RL: NUU (Other use, unclassified); USES (Uses)
(solvent; manufacture of solid **electrolytes** from acrylic polyurethanes compns. containing acetoacetoxyethyl (meth)acrylate, unsatd. polyurethanes, and Li compds.)

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